SEP 5

Telephony

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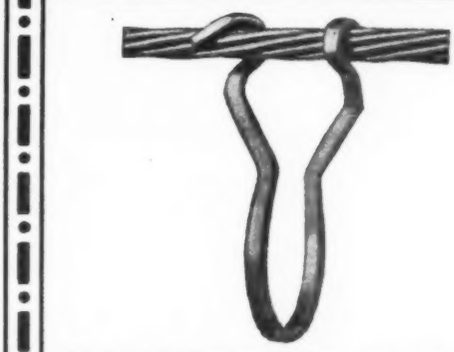

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Telephony

THE AMERICAN TELEPHONE JOURNAL

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SOME OPINIONS AND COMMENTS ON CURRENT TELEPHONE TOPICS

Business men are constantly being urged to adopt theoretical ideas, and methods based on "book learning" but they usually find that Old Man Facts and Every Day Experience will do the job better. For instance, take the case of the Lincoln Telephone & Telegraph Co. in preparing its annual budget for the year's operations:

In other years this progressive company, through its statistical department, formulated its budget on a basis of percentages, prepared with care, showing estimated revenues and indicating what and how appropriations should be expended. These estimates were often found to be out of line—sometimes as much as 20 per cent.

* * * *

Now, however, the company proceeds on a different plan. The annual budget for 1926 is based on the actual receipts for the past year—not the estimated receipts for next year—and the records of the last five years have been consulted to ascertain the situation existing during each month of the year.

This is found to be a far safer method than the old percentage system, as it enables the company to make accurate estimates of what revenue will be available for the coming months. For example, so far this year the actual receipts have showed less than a thousand dollars' difference from the revenues estimated a year ago, the total amount involved being nearly a million and a quarter.

Knowing what the receipts per station actually were last year, the toll revenue per station, and the average gain in telephones, the Lincoln company is able to build its budget with confidence and assurance.

Cold facts and actual experience will beat theoretical figures and hypothetical propositions any day in the week.

* * * *

Secretary of Commerce Hoover gave state regulation of public service companies high commendation in an address he made recently before the National Electric Light Association convention. In all but two states—Iowa and Texas—commissions exist to regulate service rates, while questions pertaining to service are controlled in all but five. Furthermore, the financial operations of utilities are publicly supervised and controlled in a majority of the states.

In view of these facts, Secretary Hoover argues that public regulation has been thoroughly tested. The results, he points out, justify the continuance of the system.

In his characteristic, logical style, Secretary Hoover says:

"To know whether regulation has really worked to public interest we must examine its actual results. It seems to me that there are two final tests of this question.

The first is: Is the service adequate and is the industry progressive in its provision for future need? The second is: Are the rates reasonable in themselves and are the profits taken by the industry upon the capital invested extortionate?

In the national sense, the industry is acquitting itself well in service. Its initiative in scientific investigation, in application of discovery, its extension of service, is of the highest order of American business. The service leads all other in the world and it improves every year."

* * * *

As to the reasonableness of rates, Mr. Hoover contends that this test has also been satisfactorily met, notwithstanding increased labor costs and taxes. He concluded with the statement that "the state commissions are doing their job well, and, likewise, democracy is demonstrating its ability to retain mastership in its own house."

All service companies will concede that there has been a vast improvement in the work of commission regulation in the last few years. Probably both the companies and the commissions have contributed to this desirable progress, as there has been much better cooperation between the two.

Now if taxes—which increased 400 per cent since 1912—are reduced within the next year, as seems likely, the situation of service companies will be materially improved.

* * * *

TELEPHONY has received a letter from a subscriber—it will be found on page 15 of this issue—which contains an excellent suggestion.

Undoubtedly the pioneers in the Inde-

pendent telephone business can recall many interesting incidents connected with the early days that should be set down in black and white and preserved as part of the annals of the industry. Reminiscences of this sort usually mark the gatherings of telephone men at their conventions where the telling of one story awakens the memories of others and leads to a pleasant exchange of interesting recollections.

"That Reminds Me" would be a good title for a department containing accounts of such reminiscences, and TELEPHONY will be glad to publish such contributions as old-timers in the business may send in.

The telephone industry is really an infant in years, so nobody who may be classed as an "old-time telephone man" need be afraid of being regarded as aged or as a back-number.

While the 50th birthday of the telephone comes in 1926 the big things in its development did not begin until the late 90's—barely 25 years ago.

* * * *

Observers of business conditions are taking a very hopeful view of the situation, and predict that the coming months will bring even better times than we have had this year. Students of employe relations agree that they are steadily improving and believe that this harmony and good feeling largely explain the peace that prevails in labor circles.

For 66 years the oil industry has operated on a 12-hour basis, but the other day Standard Oil of New Jersey adopted the eight-hour day for its laboring force. It is a good sign that the cost of this radical change is to be divided between the company and its employes, the hourly rate of pay being somewhat increased simultaneously with the reduction of hours.

* * * *

Such developments furnish proof that life in this country is surely becoming more comfortable for the average man. Wage earners today are receiving pay that was considered impossible before the war, and their hours of employment are being reduced so they may the better enjoy it.

As one economist describes it: "The cycle of great prosperity in the United States which is now on began with the increase of wages to amounts which were formerly inconceivable. It was followed by generous buying on the part of the wage-earners, which, in turn, has resulted in a demand for more liberal production."

* * * *

Good judges believe that American business is now settling down to a stable basis where there will be neither big booms of abnormal activity nor distressing stages of depression, but a happy medium of reasonable prosperity. If that be true the nation is to be congratulated upon the outlook.

COMING CONVENTIONS.

New Hampshire, Keyser Lake, North Sutton, Huntoon House, September 17 and 18.

Indiana, Indianapolis, Claypool Hotel, September 22, 23 and 24.

United States Independent Telephone Association, Chicago, Sherman Hotel, October 13-16.

Illinois, Peoria, Jefferson Hotel, November 18 and 19.

Training Operators; Bulletin Board

Training of Old as Well as New Operators Necessary for Efficient Service—Operators' Classes—Bulletin Board a Source of Interest and Instruction—Second Prize, Traffic Division, "Telephony's" Article Contest

By Miss Manta J. Elder,

Chief Operator, Kansas Telephone Co., Ottawa, Kans.

In any vocation the efficiency of the one engaged in that particular form of work depends, to a great extent, on the training received.

The clerk in the store is trained to properly receive her customers and to put up a good "selling talk" for the goods that she sells. The traveling salesman has seasons of training for his special work.

The minister, the doctor and the teacher spend much money and many years in hard study preparing for their special work and yet, so long as they remain engaged in their work, they must be in constant training in order to efficiently perform their duties. In fact, all professional people need not a few days or weeks of special training, but during the entire period of their work a certain amount of coaching,

No prosperous occupation is carried on in the same old way year after year. Obviously then, in order for the employe to keep in touch with new ideas and to be up to date he, or she, must be in continual training.

The training of an operator does not differ in this. Of course, we all know that the student requires much training before we can class her as an operator, but we are more likely to forget that the operators, both new and old, need training also.

Every traffic department has a certain percentage of students each year. They also have a number of new operators who have had only a short period of training, and some old, or experienced, operators.

Now suppose the chief operator of a certain traffic department considers the student training as sufficient to perfect an operator, and, as soon as the student has graduated to operatorship, relaxes and gives little or no further training until the next student arrives.

What degree of efficiency do you suppose the student, the new operator, or, even the old operator, will attain? Just about the same degree as your right hand would, if it were strapped to your side for a number of years. No matter how conscientious the operators were, or had been,, when first employed, they would have no incentive to be really efficient.

I have heard people complain of the drudgery of the work they are doing. Seemingly, they are not interested in their vocations. When I hear this, the first thought I have is that surely they have not found the real meaning of their work, and if they have not I feel confident that at least a part of the trouble is in the lack of training.

So it is with the operators who are left to work out their own problems. What opportunity do they have of learning new and better ways to carry on the great work in which they are engaged?

At first, when assigned to a position, they are eager and anxious to prove to their chief operator and supervisor that they are made of winning stuff, and they work hard and conscientiously.

At this point a word of praise or encouragement will go far in keeping the new operator interested.

If, however, neither the supervisor nor the chief operator pays any especial attention to her beyond, perhaps, to mentally note that she seems to be keeping her calls

answered as well as could be expected, she soon loses her enthusiasm and the work begins to be a drag.

Any work worth doing is worth doing well, and the only way to do this work well is to have a knowledge of the rules and practices involved. How can any chief operator expect her department to be efficiently operated unless she is familiar with all the rules and practices of her company? Yet her information will be of no benefit to anyone unless she passes it on. It is doubtful if any chief operator keeps herself informed if she does not see that her operators reap the benefit.

Her company furnishes her textbooks, not to be filed away in her desk and locked up when she is off duty, but to be studied and taught to her supervisors and operators.

In the ordinary office, where the chief operator has charge of both local and toll work, she will probably reap better results by holding most classes herself, rather than have the supervisors do so, although it is a good idea to teach her supervisor to do this work.

In our office, where there are 30 operators employed, the chief operator being in charge of all work, we have found it profitable to have our operators copy in notebooks some of the rules and the phrases. It seems that writing these rules and phrases down stamp them more firmly in the operators' minds.

There are more details on toll that can be handled in this manner than on local.

Training of Toll Operators.

We usually have from two to four girls in training for toll work. Of course, we do not use all our toll students on toll all the time. We have found it very much to our advantage to have many operators in waiting for toll work. Nor do all our regular schedule of toll people spend all their working hours in this work.

There are several advantages in having more than a working schedule of toll operators. One of the best reasons for this is that if there is an epidemic of sickness and our toll force is depleted, we can carry on the work very well with the local operators who, although not quite as efficient as the regular force because of lack of constant practice, yet do good work because they are being given periodic drills in phrases, ticket handling, circuit building, and all other necessary requirements of an efficient operator.

"To My Thinking There Is No More Enjoyable Work Than This Training of Operators," Says Miss Elder. "There Is Something Really Inspiring in the Development of the Operator."

The season of practice they now have will bring up their standard of service and be of great benefit to them.

Another advantage is, that on holidays, when our operators work only a part of their regular hours, we can make a much more popular schedule, so far as the girls are concerned, because most of them can work anywhere.

Our toll classes average three operators. The first thing they do is to copy a lesson in notebooks. This first lesson deals with "Classes of Service." After they have copied the lesson, we hold a class meeting and discuss the different classes of service. We do not go deeper than this, but by the time the hour is up the girls have a pretty fair knowledge of what "station-to-station," "person-to-person" and other classes of calls mean.

The next lesson is on "Toll Charges." Some time during the next week this lesson will be copied. In order to do this copying, the operators are taken from the board during slow periods, the change in work being a rest for them as well as being to their advantage.

When we meet for class for the second lesson, we first review Lesson I. It is rather astonishing to find that the operators retain as much of Lesson I as they have. Usually each one can give a perfect definition of each class of service.

We then take up the next lesson and, with the aid of the notebooks, the girls soon have a fair understanding of "Toll Charges." The next lesson is on "Report Charges" and is handled in the same manner.

Each time we have a class meeting for a new lesson, we first review the lessons that have gone before. The students seldom refer to the notebooks for definitions.

We have, also, a blackboard in our restroom, on which a facsimile of an out ticket is painted in white. In connection with lessons relating to the handling of calls we use this blackboard to excellent advantage. We also use the restroom telephone, the chief operator's telephone, and the telephone in the wire chief's office in teaching the girls to pass the calls.

These student toll operators are allowed to listen in on efficient toll operators whenever possible and also to pass calls under the supervision of an instructor.

Some of them are assigned toll work before we complete the toll lessons, but they also continue with the class until the course is finished. Others are not assigned toll places until after they have finished the course, and still others are never assigned regular toll work.

Even though we find that all these students are not capable of making

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For the second time Miss Elder has carried off high honors in TELEPHONY'S prize article contests. In the contest conducted during the spring of 1924 her article, entitled "Chief Operator's Responsibility," was awarded second prize in the traffic division and her article, "Training of Operators and the Bulletin Board as a Source of Interest and Instruction," took second prize in the same division this year.

Miss Elder is a woman of ideals as well as ideas and her sincere devotion to her work is one big factor in her success as a chief operator. She regards her position as chief executive in the traffic department as a privilege as well as a responsibility.

She not only instructs her operators wisely and consistently in the efficient performance of their duties, but she encourages and inspires them to take a real interest in their work. Her instruction classes are looked forward to with eagerness by the girls, which is ample proof of the success of her methods.

After some 13 years of experience in telephone operating—seven as chief operator—Miss Elder understands her work thoroughly. And with her experience in telephone work she has developed an understanding of human nature and has gained a genuine love for her work. Her hobby, she says, is her work and her operators—and she looks out for the welfare of her girls as zealously as she strives to maintain the best service in her exchange.

Miss Elder has been associated with the Ottawa, Kans., exchange during her entire telephone career—first with the Kansas City Long Distance Telephone Co. and since the consolidation of the Home and Bell in 1915, with the Kansas Telephone Co. She has assisted in conducting operators' schools at both state and district meetings and a number of the helpful and inspiring papers she has presented have been published in TELEPHONY'S columns.

efficient toll operators, they do very well for necessary substitutes and are efficient local operators, so we have profited to some extent and they, also, have a better knowledge of their work.

We do not forget that our experienced operators need occasional coaching. Perhaps they are not called so frequently to class, but they are given a few hours each month and many phases of the work are discussed. Perhaps some operator has met with an unusual situation. Although correctly disposed of at the time by the supervisor, it is brought up in class and the other operators receive the benefit of the discussion brought out.

We vary these lessons for our "old" operators. Sometimes they will be about circuit-building and clearing, sometimes they are on classes of calls and toll charges; at other times we take up recording or phrases. There are so many interesting and instructive phases of toll work that it is never difficult to choose a subject. Toll ticket errors are thoroughly discussed in these class meetings.

Special classes are held when the operators are lacking in any particular point of their work. We receive a great deal of benefit, whereas if corrections were made only at the switchboard, others would not be warned of the same errors that might come their way.

When we first began holding regular classes, we were making many mistakes in ticket detail. About that time we began the practice of having our tickets checked hourly for errors and a re-check made the next morning by an efficient operator who also rated the ticket.

Unusual or serious errors were noted and brought up in class time. Thus, not only the operator who was responsible for the mistake, and who was required to correct her own error, but other operators became familiar with the wrong detail and with the proper correction, thereby benefiting each of us. After a short time our errors were reduced to a very small percentage of their former number.

What did it? Training, of course. Teaching the operators why errors are undesirable and how to avoid them.

It may seem strange, but we found that many of our operators were perfectly innocent, because they really did not know how to correctly finish a ticket and were just as anxious as their chief operator to make a good record, as soon as they knew how to do it.

Their training had been sadly neglected, and so the inefficiency was more the fault of the person whose responsibility it was to see that the force was well trained than any defect of the operators themselves.

Training of Local Operators.

Many chief operators consider the toll work of much more importance than the local and neglect the latter class of employes. This, of course, is an incorrect attitude.

If chief operators realized how much they, themselves, gain by holding local classes they could not fail, if only for this reason, to take this part of their work seriously and would let no obstacle prevent the calling together of their operators for occasional class.

What really makes a successful chief operator? Is it her personal ability? Her knowledge of rules? It is not. Certainly she made both these requirements, but if she stops with that she will never be a successful employe. It is the manner in which her department carries on the work allotted to it that determines her status as a leader. And this work will be properly conducted in proportion to the correct training her operators receive.

Local operators are, perhaps, more closely connected with the public than toll operators. Everybody does not place long distance calls, and many of those who do, do so infrequently. On the other hand, these subscribers will use the local service many times a day.

Because of this the local operators are of great importance to our public, and the manner in which they meet the public and perform all duties will cast either a good or bad reflection on the chief operator. Therefore, it should be a pleasure as well as a duty for the chief operator to spend a portion of her time in teaching.

To my thinking there is no more enjoyable work than this training of operators. There is something really inspiring in the development of the operator. To watch her grow from the student, who has not the least idea of the vast field of work she is entering, to the well-trained, enthusiastic operator who, no matter how long she remains with the work, endeavors to improve her work day by day, is more than worth the time spent in training her.

Now during this period, which lies between the student and the efficient operator, there is great necessity of much training. And who should be more capable of doing, and more ambitious to do, this work than the chief operator? It can be made one of the most pleasant, as well as a most profitable work if entered into in the right spirit.

Class meetings afford one of the best possible opportunities for the chief operator to come into close contact with her girls and thus to obtain a clear understanding of their characters. It is a good idea to have a few moments of each class free for the operators to express their opinions as to our rules and to criticize, in the proper spirit, of course, any part of the work. Constructive criticism is an important factor in the building-up of any organization.

If an operator does not understand why she does certain parts of the work in certain ways, it is much to her interest, and her company's also, that she reach a clear understanding of the why and wherefore of these things. There may be cases where special phases of the work are not supposed to be thoroughly explained to them, but a wise and understanding chief operator can usually make an explanation that will satisfy the girls.

I have been told that operators are prone to criticise their subscribers too much in these classes and to think that the instructors are inclined to think they (the operators) are ignorant in the work if called to many classes. I cannot see it that way. True, some girls may have a desire to blame their patrons for being cross or hard to serve, but I have found that instead of being an encouragement for this attitude, the class meetings have been a source for eliminating this very undesirable feeling.

At our exchange we had two patrons who were unusually difficult to please. Every few days one or the other, or both, would have some complaint of the service. Realizing that if we expected to please these patrons, our operators must first have the right attitude toward them, we took the matter up in our class meetings, and each girl, without a dissenting voice, pledged herself to make an effort to win these two subscribers for the company.

And they did. It has been many months since we have had a service complaint from either of them. The operators, themselves, brought this about, with a little training as to why we must first have the correct feeling toward our public before we can expect this public to feel right toward us.

I can honestly say that we never hear unkindly criticism of our people by the operators in class. Our operators enjoy their classes and are always pleased when we place a notice on the bulletin board that, on a stated date, certain operators will be called to class. The only disappointed ones are those unfortunate enough not to be named for this special date. If for some reason considerable time elapses between classes, we hear from several employes, "When are we going to have a class?"

We vary the lessons so that they will not become monotonous. Sometimes we have a course of special lessons. A short time ago we held classes on lessons from a small book on "Local Service Notes" sent us from a larger station. These lessons included: Order of attention to signals, answer to line signals, handling calls, wrong numbers, double connections, cut-offs and recalls.

The operators wrote, in notebooks, the principal phases of these lessons and a list of questions was written by the chief operator on each lesson. These questions, used in class, brought forth much discussion, through which we all reached a better understanding of our work. After this

course was completed, each operator was asked to write a paper on one of the lessons, making her own choice of subject. We had some very interesting and instructive papers handed in.

All our lessons do not follow a special routine. If our service seems to be a bit slack in any one thing, we have a few classes on that subject.

Frequently we drill in voice. As the operator's one great asset is her voice, it should be trained over and over again.

Our restroom blackboard is effectively used in these classes. On the board we list the errors occurring in our work and opposite, as the class names them, the manner in which they may be eliminated. When having a voice drill we write each digit separately and then take turns in pronouncing them. Certain digits that sound alike, as "5" and "9," are worked with over and over again.

The thing that proves the worth of this is that when the operators return to their positions from class, they are not forgetful of the training they have just had and make special effort to use the knowledge, or rather the new practices. The knowledge was already there but we needed a "brushing up" of our minds to bring about a fresh interest in our work.

The supervisors are enthusiastic about these classes because their work is made more pleasant by the training the girls receive. They say that each time the members of a class return to their positions there is a noticeable improvement in the use of phrases, their tone of voice and their pride in the work they do.

Arrangement for Classes.

Perhaps some one will ask, "When do you find time to hold these classes?"

We have found that it is very difficult to set any stated time for class meetings for a longer advanced period than one day ahead, and even then we are sometimes disappointed in our plans, because some one may be on the sick list, or off duty for some other cause.

We have found it inadvisable to call class meetings at periods when those operators we expect to call to class are off duty. The girls like to feel free when they are away from their positions and it is as much to our advantage as theirs that they have this freedom. For this reason we arrange to hold our class periods during slack hours, or seasons, of the work.

Most of our classes are held during the season when vacations are not being given. Only such classes as are absolutely necessary in order to care for our students and new operators are conducted during the season from May 1 to September 1. During the period from September 1 to May 1 most of our training is carried on.

Sometimes our classes are called at a few minutes' notice. If there is a 15- or 30-minute period after the relief period, we call a class of two or three operators and drill on voice, or practice phrases. As a general thing, the classes are in one-hour periods, but we frequently have classes of 30-minute, or even 15- or 20-minute periods.

When we arrange for a class a day ahead, we endeavor to have at least four in class, not including the instructor. We begin at 9 a. m. and the first class is called from the group of girls who would ordinarily have their relief period some time from 9 to 10. The class adjourns about 10 or 15 minutes before the close of the hour, thus allowing the girls a few minutes' recreation. However, the operators often remain in class, discussing various phases of the work, until the last bell rings.

When the class returns to duty, another group who would have their relief about 10 o'clock comes on, and so on through the day, with the exception of the hours from 11 a. m. to 1 p. m.

As much talking is involved during these five or six hours' work, the instructor is really weary at the end of the day, but she is fully repaid by the renewed zeal and determination with which her force takes hold of the work.

PIONEERS, WHAT IS YOUR STORY? SEND IT IN!

"In view of the fact that the semi-centennial celebration of the invention of the telephone will occur next year," writes an Independent pioneer, "it seems to me that it is now opportune for interesting telephone men over the country with the view of collecting and recording many interesting incidents which have occurred during the commercial rise of the telephone business.

"I do not refer to the purely technical phases so much as to the amusing and political incidents. Nearly every pioneer can, if he will—and he should—tell a number of happenings which will be highly amusing, looked at from the present stage of the telephone business.

Such items could be written by and authenticated by the one who had contact with the incident, or it could be written by someone else, though names and addresses of the ones furnishing the items should be considered a part of the item.

These items could be published from time to time to keep all reminded to do their duty if they have any story which will be of interest. They should then be published in book form, because a few years hence these stories will have been lost with the passing of the men holding them in their memories.

'Telephony,' it seems to me, is the logical agency to carry this out. Enter my order for a copy of the book."

It would be a difficult matter to find a better way of keeping up interest and enthusiasm among the operators than by means of the use of the bulletin board.

Bulletin Board a Source of Interest and Instruction.

This board, in our office, is placed in the restroom in a place where the operators cannot fail to notice the items posted. Not only do we use the bulletin board as a means of conveying new rules or refreshing our minds on old ones, but also as a place for any good reading matter we may wish to post.

This latter is not always telephone news, although much of this is posted. Our own TELEPHONY furnishes us each week with at least one—more often several—items of good reading. We also clip short articles of foreign or local interest and current news from the newspapers and magazines. Frequently some of our girls will bring a short sketch of humor, knowing if it brought a laugh to them it will do the same for other girls.

Does this seem useless? Do most of us think the girls will do their reading at home?

Well, of course, a great number of them do, but in nearly every large group of people there are the few who take much less time than they should for this—to some of us—vital part of living. These few will read the little articles posted on the board and find them interesting and diverting.

For the benefit of our toll operators we keep a daily record of our "completed," "uncompleted" and "per cent completed" of toll work. They are able to tell by this record just what they are accomplishing each day. We set an objective for them as their "per cent completed" for the month, and day by day they can easily tell just how much they are above or below that objective. Our objective for February was 92.6 per cent completed. The actual per cent completed was 92.9 per cent.

We feel that the bulletin board had a great share in bringing this about. If the operators notice that they are slipping back in their record they make a special effort to bring up the percentage. If they are above the average, they are so enthused they endeavor to at least hold their record steady.

For our local girls a record of peg counts, a case of especially good service credited to one of them, a word of praise from a patron, find room on the board. All this means much to all the girls and encourages them to better work.

One thing we should remember: Whenever a bulletin board is used, it should never be allowed to grow stale. Special posted matter should not remain on the board for more than two consecutive days. If the employes find the same old stale articles posted for several days, they

will cease to look for good reading, or something new.

Operators' classes and bulletin boards are inspirational and educational, but they must be kept interesting and not allowed to grow monotonous.

Our girls are up-to-date and quickly resent out-of-date, run-down methods. Chief operators and supervisors will do well to always remember this and act accordingly.

Plans for Three-Day Indiana State Telephone Convention.

This year's convention of the Indiana Telephone Association, to be held at the Claypool Hotel in Indianapolis, September 22, 23 and 24, will be largely a "round table" gathering. Of course there will be a number of addresses and papers on topics of vital interest to wideawake telephone men, but ample time will be afforded for discussions and for inspection of the manufacturers' exhibits.

One session will be devoted to the consideration of local and long distance operating problems, and telephone men are urged to bring along to the convention their chief operators and as many other operators as they can spare.

"Better State-Wide Service" will be discussed by a man who has traveled extensively and appreciates the need of better toll line facilities throughout the state.

The governor of Indiana and a member of the state public service commission have been invited to deliver addresses.

Plans are under way for making the banquet the usual outstanding social feature of the convention, with entertainment features that will delight everyone.

This is the first three-day convention to be held by the Indiana association in some time and it is expected that it will be one of the most important ones in the history of telephony in that state.

Employes of Pacific Bell Reduce Accidents 60 Per Cent.

As a result of instructions received in first aid methods among 9,000 of the employes of the Pacific Telephone & Telegraph Co., accidents have been reduced nearly 60 per cent in the past two years.

BOXED—LABELED.

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

This morning I took an early walk down to the depot to arrange for a vacation trip. I was feeling in the best of spirits and carefree as anyone should be who is about to enter into the full enjoyment of a good rest and be with home folks for quite a spell.

As I rounded the corner, I almost jostled against a truck bearing a long box, properly labeled, in which some poor mortal was laid for his or her long vacation. What mattered the noise and smoke of trains, of loud laughing and talking, of tears and flowers now or any time to the person within the box?

"The end of the trail for someone," I thought as I passed into the depot. Well, we must all take that journey some day. But some folks who today are walking the streets, holding positions, and intermingling with their fellowmen, are in reality, boxed and labeled. Such people live within themselves. All one ever learns about them is their name and a few other identifications.

Take, for instance, Cora Whatstheuse. You could not enthuse that young woman along any line. She never could see the use in local or long distance instructions changing. She did not believe in schools for operators. "What good are peg counts, and the reports of various natures we prepare?" she opens her human casket a crack and snaps out. Although she lives among us, takes nourishment to sustain the little house within which she lives, she is really not of any particular use to humanity or to herself, that I can see.

I am wondering how she will fit into the scheme of things in the next world. There, she will not have her little human house to hide within; that she will leave here. Well, I am glad I do not have to figure that out. I must confess I am unable to figure out just how to handle her type when I come in contact with her in my work.

I will say this to telephone managers: There is no more unsafe situation than to continue in your service the operator who gives nothing except her labeled presence to the company she serves. Today is the day when live people are in demand, and especially so in the telephone service.

MORAL: Snap out of yourself if you want to be useful—and don't snap back. Remember, the undertaker will get you soon enough anyway.

Arrangements for National Convention in Chicago Under Way.

Secretary-Treasurer Chas. C. Deering of the United States Independent Telephone Association was in Chicago this week making arrangements with the Sherman Hotel management for the national convention to be held in that hostelry October 13-16 inclusive.

He reports that at this year's annual gathering there will be more rooms at the hotel for guests and for exhibitors and better facilities will be provided for the convention sessions and conferences. A committee of the association will work with the hotel management in assigning rooms to convention attendants to eliminate the inconvenience experienced in other years.

The program is being shaped up and will contain features of exceptional interest to every telephone man or woman. General sessions will be held Tuesday afternoon and Wednesday and Friday mornings. Division meetings of the traffic, accounting and plant sections will be held Wednesday afternoon.

Thursday will be Pioneers' Day and a feature of the day's entertainment as provided by the Independent Pioneers' Telephone Association of the United States will be the luncheon and entertainment.

At noon Friday the state association executives will have a luncheon and discuss their mutual problems.

Arrangements have been made with the railroads for the granting of reduced fares, the usual one and one-third fare for the round trip on the certificate plan having been granted.

With every indication of an exceptionally good crop, business conditions in the Middle West are good and a large attendance from that section of the country is anticipated.

President F. B. MacKinnon of the national association will return to Chicago next week, after holding successful district meetings on the Pacific coast. He will then actively engage in completing the program and making arrangements for what is expected will be the most interesting convention the national organization has held.

New York Association to Hold District Meeting at Ogdensburg.

A district meeting and traffic conference of the Up-State Telephone Association of New York will be held at Ogdensburg on Friday, September 18. The association has accepted an invitation to hold its sessions in the new building recently erected by the Northern New York Telephone Corp.

Every telephone company within the district is urged by J. G. Ihmsen, vice-president and general manager of the association, to send several representatives and as many telephone operators as possible.

The Economic Provision of Plant

Factors to Be Taken Into Account When Considering Annual Costs in the Engineering of Telephone Plant Facilities—Manner in Which the Time Factor Is Taken Into Account—Illustrations of the Practical Use of Annual Costs

By C. G. Barker

In providing public utilities, such as telephones, gas, water, electric light, etc., the object in view should be to provide the best service at the least *annual cost*. The question of capital cost is of minor importance since, if a fair return is given on the investment, there is no difficulty in obtaining capital, and when the services are run by the state, loans can easily be raised.

When considering costs on this basis the first question which arises is: Over what period are the annual costs to be considered?

This is governed by two main factors:

1. The average life of the plant.
2. The period over which the future can be reasonably predicted and over which a financier would be prepared to consider a scheme.

In telephone work the average life of all classes of plant is usually assumed to be about 20 years and, although ducts may have a life of over 50 years, in deciding between two schemes it is usual to compare the annual cost over a period of 20 years only.

The effect of considering a longer period is to favor the provision of more plant initially, and this has the disadvantage of making the service more expensive in the early stages, although the costs over the total period may be slightly less. Let us assume, therefore, that 20 years is the correct period to consider.

It is obvious that it will not be economical generally to provide plant for 20 years ahead, so the question arises: When should the instalments be made? What proportion should be installed at once, and what proportion should be deferred?

In considering annual costs, account must, of course, be taken of the time factor; that is to say, when the money is spent. To spend \$1.05 at the end of a year *costs no more* than to spend \$1 at once, if the money is bearing 5 per cent interest in the meantime. That is to say, in considering annual charges over any period, we must consider the "present value" of those annual charges.

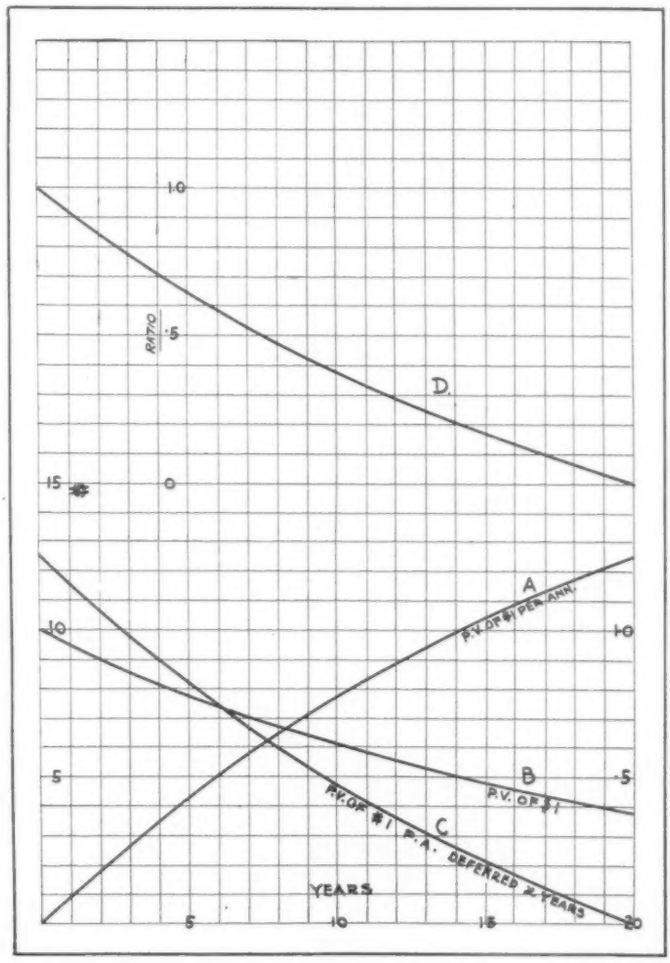


Fig. 1. Curves Showing "Present Value" of \$1 Under Various Conditions.

The present value of the annual charges of a scheme is the amount of money which, invested at a given rate of interest, will pay those charges over the period considered. This is sometimes referred to as the "capitalized cost" but must be distinguished from "capital cost."

We will next consider the capitalized cost or present value of \$1 spent at different times: an annual charge is always considered to be made at the end of the year and not at the beginning. The curves of Fig. 1 show:

A. The present value of \$1 per annum at 5 per cent up to 20 years.

B. The present value of \$1 at 5 per cent up to 20 years.

C. The present value of \$1 per annum at 5 per cent up to 20 years, starting after the beginning of a period.

Curve *C* obtained from curves *A* and *B* gives us the actual present value of \$1 per annum deferred x years and then spent yearly to the end of the 20-year period.

Example: Take from 5th year onwards:

P. V. of \$1 P. A. for 15 years = 10.4
P. V. of \$1 for 5 years = 0.78
$10.4 \times .78 = 8.2$ (5-year, curve *C*).

It will also be seen from this curve that the present value of \$1 per annum for the last five years is only \$2.2, which clearly shows the relative cheapness of deferred charges.

The nature of the problem to be solved can best be shown graphically. In Fig. 2, suppose area *OABC* represents 20 annual payments made on the first instalment of plant and *DEFB* payments on the second instalment towards the end of the period. Suppose OA_1B_1C represents 20 annual payments on the whole installation at once. For the instalment system to be cheaper:

The present value of *DEFB* must be less than the present value of AA_1B_1B.

That is: The present value of the difference in the initial annual costs of the whole scheme and the first instalment must be less than the present value of the annual costs of the second instalment deferred.

Since annual cost on any type of plant is a fixed per cent, the annual charges at any date are proportional to the capital outlay. By means of curve *C*, we can now find how long the second instalment of any plant must be deferred in order to make it more economical than installing all at first. For instance, take the example of two-way duct now, against one now and one later (two ducts being sufficient for 20 years).

Suppose one-way duct costs 10 units per meter; two-way costs 12.5 units per meter. Take annual charges at 12 per cent. Then the ratio of annual charges is in the ratio of

$$\frac{10 \times .12}{12.5 \times .12} = \frac{10}{12.5}$$

P. V. of $1 per annum at 5 per cent for 20 years = 12.46.

P. V. of annual charges on 2-way at once is 12.5 × 12.46.

P. V. of annual charges on 1-way is 10 × 12.46.

P. V. of annual charges on 1-way deferred is 10 × Y.

(Y is the P. V. of $1 per annum deferred the required number of years.)

These are equal when $10 \times Y = 2.5 \times 12.46$.

i. e. $Y = 3.12$.

From curve C, 3.12 is the present value of $1 per annum for 7 years deferred 13 yrs. Hence if a second duct is required before 13 years, it pays to put it in at once.

From the foregoing reasoning it will be seen that

$$Y = \frac{(\text{Cost of 2-way}) - (\text{Cost of 1-way})}{\text{Cost of 1-way}} \times 12.46$$

(12.46 is P. V. of $1 p. a. for 20 years).

We can, therefore, construct a new curve, D, which is C divided by 12.46. Using this curve, we only require the capital costs to find at once the economic period for a 2-instalment proposition; i. e., we only require to know the ratio of costs $(B - A)/A$.

The curve is applicable to any plant in the same way as to ducts.

It is interesting to note that with plant of the same kind (ducts v. ducts), the actual annual charges have no effect on the economic period, this being governed by their ratio only.

By this means, using curve D we can at once find the economic period to defer the second instalment of any plant. Taking our original example of 2-way against 1 and 1 deferred, curve D for .25 gives 13 yrs.

$$\frac{12.5-10}{10} = \frac{2.5}{10} = .25$$

That is, it pays to place 2-way duct if a second duct is required within 13 years, considering charges over a 20-year period and interest at 5 per cent.

We next have to take into consideration when the second duct is required. This, of course, depends on the development. A common figure for development is about 10 per cent annual growth and with this increase any number of lines doubles itself in about 7¼ years; at 15 per cent, lines double in 5 years; at 6 per cent, lines double in 12 years.

Reverting to the example of 2-way against 1-way and having the figures for the number of lines to be provided at present and the development or rate of increase, we can at once see how long one duct will last and when the second will be required. In this case, if the growth is slow and one duct will last over 13 years, lay one duct. If there is a high rate of growth and one duct will not last 13 years, lay two.

This applies to any plant and we only have to find the ratio $(B - A)/A$ and curve D at once gives us the economic period to defer.

Suppose development figures show 3-way ducts to be necessary in 5 years and six in 10 years. Should we lay all at once and suppose capital cost of 3-way is 15 units per meter, 6-way is 21 units per meter.

Then $$\frac{21-15}{15} = \frac{6}{15} = .4$$

From curve C it will be seen that deferred work is cheaper after 9½ years, so that we should lay three now and three in 10 years' time.

There are, however, other ways of providing for the growth, such as two now and four deferred, and curve C gives a ready way of comparing the present value of annual costs of these alternative schemes as shown in the table.

The total present value of annual costs is proportional to the figure given in the last column of the table and it will at once be seen that four now and two later is the cheapest scheme. This corresponds to about a 15-year period; in practice we should lay, say, 4-way now and after 15 years sufficient to provide for the next 15 years.

The system of using cost ratios greatly simplifies the arithmetic, without impairing the accuracy of the results obtained.

Comparative cost of ducts	1-way =1.0	2-way =1.25	3-way =1.5	4-way =1.7		6-way =2.1
Year	Now	7½ yrs.	11½ yrs.	15 yrs.	17 yrs.	20 yrs.
Ducts required	1	2	3	4	5	6
(P. V. of $1 deferred from Curve C.)	12.46	6.4	3.9	2.2	1.25	
						P. V. of Total A Costs
Lay	2	1	1	1	1	
P. V. of annual cost	15.6	6.4	3.9	2.2	1.25	29.3
Lay	6	0	0	0	0	
D. V. of annual cost	26.2	0	0	0	0	26.2
Lay	2	2	0	2	0	
P. V. of annual cost	15.6	8.0	0	2.75	0	26.35
Lay	4	0	0	2	0	
P. V. of annual cost	21.2	0	0	2.75	0	23.95
Lay	3	0	3	0	0	
P. V. of annual cost	18.7	0	5.86	0	0	24.56
Lay	2	4	0	0	0	
P. V. of annual cost	15.6	10.9	0	0	0	26.5

Total Ducts in 20 Years: Development 10 Per Cent Per Annum.

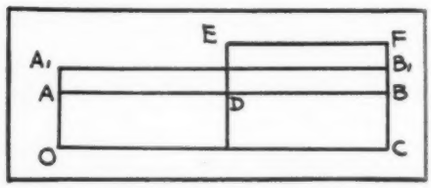


Fig. 2. Graphic Presentation of Annual Costs' Problem.

London-Paris Toll Operators "Swap" Positions.

Paris and London are now exchanging telephone girls in relays for periods of two weeks in each city, in order to increase their efficiency in the routing of long distance calls.

The scheme applies, so far as the English telephone girls are concerned, only to those engaged in the operation of the Anglo-continental telephone lines, and at present it is not contemplated to make a similar arrangement with other foreign capitals.

French is the official language of the Paris-London line and, in fact, many of the English operators have been educated in France and most all of them speak French fluently. So, to give the girls a working knowledge of the two exchanges and the method of routing calls, the English girls will work in the French central offices at the same time the French operators will be employed at the London end of the wire on the long distance lines.

It is also expected that this method of exchanging telephone girls will help to cement a personal "entente cordiale" which it is hoped will make easier the working of the cross-channel exchanges.

Telephone Switchboards Speed Up Sleeping-Car Reservations.

An elaborate telephone system has recently been installed in the new Union Station in Chicago as a result of which there will no longer be any waiting in reserving berths on the Burlington system.

Telephone engineers have cooperated in perfecting the device to secure a non-waiting telephone service for sleeping car reservations. The reservation switchboard is handled by four operators and is so arranged that there will be no busy signal as the flash will appear on all four boards simultaneously. Also, a call to any of the different Burlington ticket offices throughout the city will automatically flash on the new Union Station switchboard.

A Modern, Efficient Indiana Plant

Work of Renewing Entire Plant of the Rochester Telephone Co., Rochester, Ind., Completed—Interesting History of Company—Every Department Head Has Had Long Experience With Company and Is a Stockholder

By L. M. Hayes,
Assistant Editor, "Telephony"

The Rochester Telephone Co., of Rochester, Ind., has recently completed rebuilding its system into very modern facilities. A Stromberg-Carlson superservice switchboard has been installed, the rural lines have all been converted into common battery construction, the lines in the city placed in underground conduit, the operating quarters have all been enlarged, lightning arresters installed on all rural stations and the entire plant has been renewed into splendid equipment.

The work was commenced about the first of March and completed June 20. And all of it was done so as to incur no interference with the operating service and subscribers were so well taken care of by the installers that there was no more than ordinary trouble interference.

The Rochester Telephone Co. was organized in December, 1895, and the history of the enterprise is somewhat remarkable. Every department head has seen long years of experience with the corporation, the president, superintendent and chief operator having been with the company continuously since it commenced furnishing service in Rochester.

Henry A. Barnhart, for many years a representative of his state in Congress, was the first president of the company, and he has continued in that capacity ever since.

Stockholder-Officials of Rochester (Ind.) Telephone Co. Left to Right: Roscoe D. Pontius, Secretary-Treasurer; Tully Pontius, Plant Superintendent; Henry A. Barnhart, President-Manager; George W. Holman, Vice-President-General Counsel; Miss Belle Bernetha, Traffic Superintendent, and Miss Mary Gould, Bookkeeper-Cashier. Four of Them Have Been With the Company 30 Years; the Others More Than Half That Long.

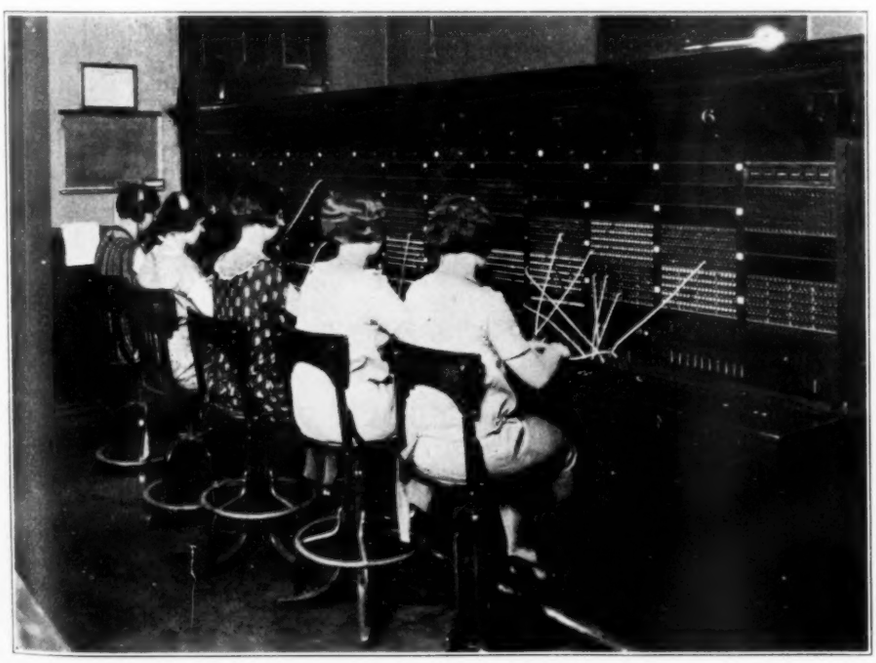
Mr. Barnhart is also president of the Indiana Telephone Association, an ex-president of the old National Independent Telephone Association and one of the best known telephone men in the Middle West.

Upon being approached for his autobiography Mr. Barnhart was very reluctant to furnish the information requested, his excuse being that every one of his associates has been equally helpful in building up the Rochester Telephone Co. And this statement of his is convincing proof of his ability as an executive, for the essential responsibility of an executive is to develop those under his supervision by wise counsel and tactful guidance.

Mr. Barnhart is a native of the state of Indiana. He was born near the village of Twelve Mile on September 11, 1858, and received his early education in the public schools, the Amboy Academy and the Wabash Training School.

When quite a young man he was elected county surveyor. Shortly thereafter he purchased the Rochester Sentinel, which he published for a great many years. Upon the organization of the Rochester Telephone Co. in 1895, he became its president and general manager. He continued to serve the company as general manager until his election to Congress in 1908, and 12 years later again assumed the position. He has served as president continuously to the present time.

Mr. Barnhart has been active in state and national telephone affairs since the earliest days of Independent telephony, serving as a director of the state association since 1918, and as president since 1919. His addresses at the annual conventions and throughout his state have been of



Operating Room at Rochester, Ind., Showing New Stromberg-Carlson Superservice Switchboard Recently Installed.

much inspiration and practical value to the telephone men of Indiana.

Mr. Barnhart's superintendent of plant is Tully Pontius, who commenced serving the company as lineman when the plant was first built and won promotions step by step until he is now one of the stockholders and a director of the company as well as plant superintendent.

Miss Belle Bernetha, chief operator and toll supervisor, was the company's first operator. Like Mr. Pontius, she is now a large stockholder and a director of the company.

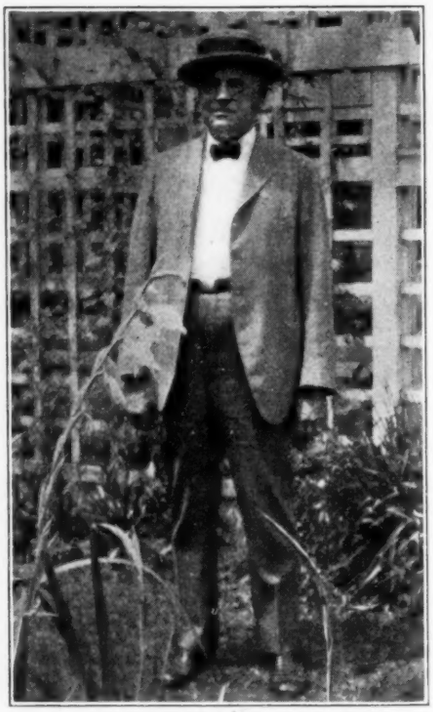
Roscoe D. Pontius, a son of the superintendent, virtually grew up in the Rochester telephone exchange. He is now secretary-treasurer, auditor, wire chief, a stockholder and one of the directors.

Miss Mary Gould, cashier, has been with the company 18 years. She is a stockholder, an experienced telephone operator and knows the business in detail.

George W. Holman, vice-president and attorney for the company, has been with it as a stockholder and director since its organization 30 years ago.

Hence every head of a department in the corporation has won the spurs of success by long experience, and it is doubtful if there is another such thoroughgoing organization of telephone men and women in continuous service in this country.

And the result of this teamwork of the same people in a business organization was expressed on July 2 when, after the new service had been installed, a hearing before the Indiana Public Service Commission was held on the company's application for a general increase in rates and not a single patron or other person appeared to protest against the proposed increase.



President Henry A. Barnhart of the Rochester Telephone Co., Former President of the National Telephone Association, Former Congressman and President of the Indiana Telephone Association.

Telephone men who have visited the rebuilt Rochester plant are unanimous in pronouncing it one of the best of its size in the state of Indiana. And the owners attribute the company's success to the fact that its employes have been urged to purchase stock in it and inspired to work for promotions until every officer and head of department is fully equipped, by long experience, to know his or her responsibilities so well that efficiency and popularity with patrons is a triumphant consequence.

Two-Day District Meeting and Traffic Conference at Tyler, Tex.

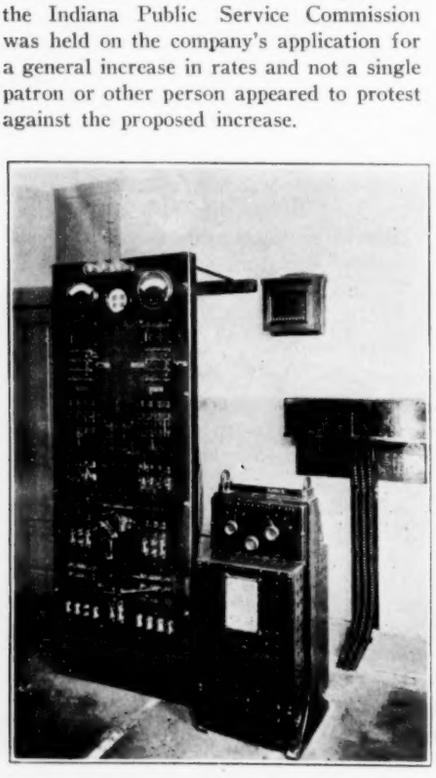
A very helpful district meeting was held by the Texas Independent Telephone Association at the Blackstone Hotel in Tyler, Texas, on August 19 and 20, with an attendance of approximately 100 telephone men and women. A traffic conference was the feature of the second day's program, with Oscar Burton, of Tyler, assistant to the general manager of the Gulf States Telephone Co., in charge.

The first day's program included addresses by President R. B. Still, who is general manager of the Gulf States company on "Why Our Service Must Improve"; by Secretary L. S. Gardner, of Waco, on "The Relation Accounting Bears to Financing"; by Geo. McQuaid, of Dallas, director of the Texas Public Service Information Bureau, on "The Public's Viewpoint of Our Service"; by Sam H. Shutt, of Waco, superintendent of the Texas Long Distance Telephone Co., on the subject, "Satisfying the Customer."

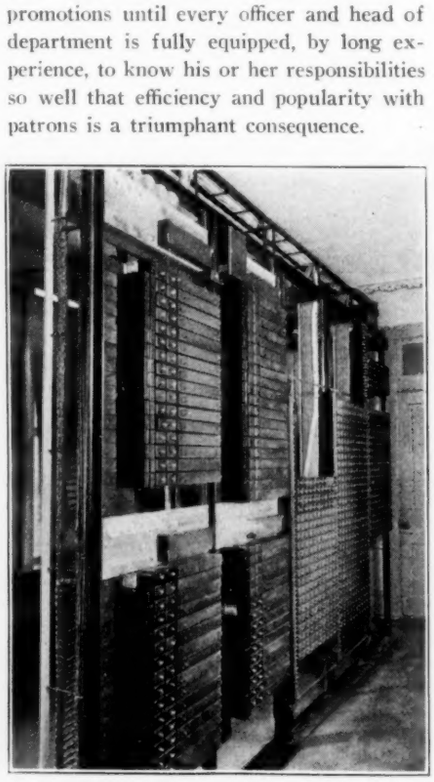
Among the subjects discussed at the operator's conference were the following: "Constructive Criticism from the Standpoint of the User," "Selection and Training of Operators—Local and Toll," "Correct Ticket and Rate Information," "Visitation Between Independent and Bell Employes," "Possibilities by Improvement in Telephone Service," "Speed of Toll Service'.'

At the conclusion of the second day's sessions the visitors had the pleasure of going through the offices of the Gulf States Telephone Co. and the local office of the Southwestern Bell Telephone Co.

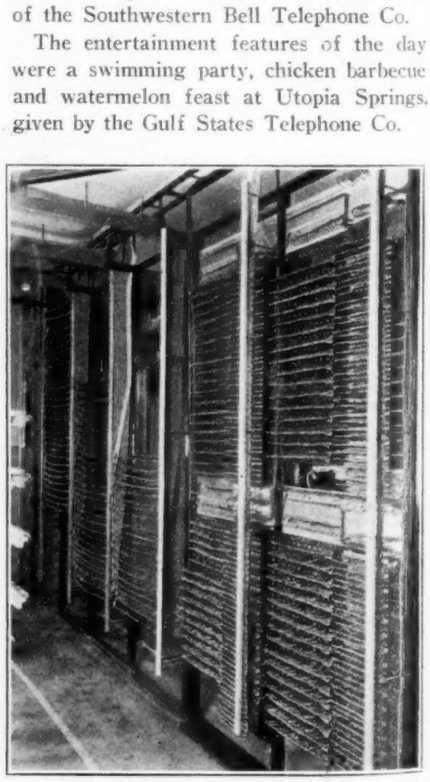
The entertainment features of the day were a swimming party, chicken barbecue and watermelon feast at Utopia Springs, given by the Gulf States Telephone Co.



View of Power Control Panel and Rectifier at Rochester Exchange.



Front View of Relay Rack Showing Line Relays and Operators' Position Relay.



View Showing the Rear of the Relay Rack's Equipment at Rochester Exchange.

Developing Good Employe Relations

Important Factors in the Education and Training of Employes in Their Relations to One Another, to the Company and to the Public—Importance of Cooperation Between Departments—Some Helpful and Practical Suggestions

By George L. Stern,
Area Manager, Northwestern Bell Telephone Co., Fergus Falls, Minn.

Employe relations form a rather broad subject, and may be considered under three divisions: An employe's relations with the company for which he works, his relations with his fellow employes, and his relations with the public.

Every one who works in a large industry is an employe, from the president down to the janitor. Employes think out and arrange plans, meet competition and obstacles which are always present, solve problems and do all of the work that is done for the institution. If the business fails, it is because one or more of the employes fails to meet the demands placed upon him; and if it is a success, it is because the employes make it a success. The employes are the institution, and it appears perfectly natural and right that they should refer to it as their company and to be proud of the accomplishments of their company.

Officers and supervisors who take the other employes into their confidence and keep them informed about their company's affairs and about plans for the future, will find that the employes are eager to know what they have helped to accomplish and what they are expected to accomplish in the future. Being interested, they will endeavor to make a little better showing this year than they did last year.

These relations can best be developed by those who understand how to secure the interest and cooperation of every employe. There always are those who do not seem to fit in just right, but by carefully selecting those who are interested in that particular line of work and excluding those who are just looking for a job, it is possible to build up a spirit of interest and enthusiasm, which means so much towards the success of any business.

Jealousy is a very common evil, which cannot easily be eradicated. An employe refrains from doing something which may appear to be helping another. He may not like the other fellow very well and, therefore, doesn't want to help him along; then there is the possibility that the other fellow may be advanced a little faster because of something done to help him do a better job. The result is that the company has not secured the best services from such an employe. If each one of these little failures of an employe is multiplied by the number who are constantly falling down in this manner, the total result may be disastrous, rather than the success which could have been.

I need not be afraid to help some other fellow to a better position, for if my superior cannot see that my full cooperation (which proves my interest in my company) is an asset, then maybe the fellow whom I helped will be able and glad to help me some time to something better.

It is human nature to want to do something nice for the fellow who has helped one.

Suppose someone needs help and you go to his assistance. The casual observer, who sees the act of kindness, feels like congratulating whom? You who rendered the assistance, or the fellow who received it? Why, you, of course.

So in business. Don't be afraid that your superior will overlook your cooperation and relations with your fellow employes. On the other hand, rest assured that he will as quickly notice your lack of interest and cooperation.

One who is friendly with his fellow employes, need have no fear of their doing anything which they know will injure him and he knows that they will do as much to help him as he would do for them.

To give value received, one must have the interests of his employer in mind and make his services valuable by putting himself into his work. One may be able to do very good work, and do it with rapidity, and think that he is indispensable, and yet find that he isn't considered so by his employer because he doesn't appear to have the interest of his employer at heart.

A very good rule for one to follow is to think of the company for which he works as his company, to make himself a part of it, knowing that the success of the company depends partly on himself, and that he will succeed as does the company of which he is a part. Keeping "my company" in mind, helps one to become more interested in the success of his company and, consequently, to see many little things which he may do that an uninterested employe would not think of.

All industries are affected to some extent by the relations of each employe with all of the others, and to a more pronounced degree by the relations of the employes of each department with those of other departments. Relations between departments may, or may not, be such as will bring about the best results for the company.

We will say that my department is endeavoring to do a 100 per cent job; we want to make a better showing than any other department. So we take the narrow view of the situation and "hoe our own row," leaving the others to do likewise. We may be able to get along very nicely, but present-day business is so complex that there cannot be a sharp demarcation between various departments. Department No. 1 does some work which is finished by No. 2; No. 3 relies on information which it received from No. 2, and so on.

The fact that there are departments indicates that the work that any one of them does is not complete without the work of all of the others. One department finds that it can finish a better product, or as good with a lower cost of production, or can serve the public more satisfactorily, if the others can make a change in methods.

Thus it is necessary for the heads of departments to keep in very close touch with each other, and for the benefit of the whole, to suggest such changes and improvements as appear to be desirable. The department head secures his information and suggestions from those in his department, to be passed along by him for the benefit of the industry.

Many employes in departments are inclined to resent suggestions from those in other departments and constant training by the proper officials is necessary to obtain best results.

Good relations between the employes and the public is of the utmost importance. The day has passed when any enterprise can hope for success with indifferent employes who represent them and who meet the public. A very good illustration of this point which comes to my mind is the following: There were two competing railroads serving a town. Their rates were the same because they were so

KNOWING MAN AND WHY.

If you would work on any man, you must either know his nature and fashions, and so lead him; or his ends, and so persuade him; or his weakness and disadvantages, and so awe him; or those that have interest in him, and so govern him.—Sir Francis Bacon.

ordered by the railroad commission; their service was about the same so far as train schedules were concerned. Their equipment was equally good, but here is the difference which meant much to the two companies:

The employes of one company replied to questions asked them and did their work satisfactorily but were a little indifferent to the public, while the employes of the other company appeared to want to give all the information they could about their business, and treated patrons as though they were friends. You know which company got the bulk of the business.

I may want something, or have work to be done, and my friends are usually the first to secure my business, providing all other things are equal. My friends give me more business than they give my competitor, if he is not as good a friend to them as I; that makes the competitor offer better inducements to secure business than I am compelled to give. My relations with the public, then, should be as friendly as I can make them.

Competition in the telephone business is disappearing and probably, in some places, there is a let-up in the effort to create and secure new business. It is much easier to secure business, which will bring in additional revenue, from a friendly rather than from an unfriendly or indifferent public. Patrons are very quick to see and criticize any little discourtesy on the part of an employe, and as ready to defend one who is doing his best to serve them.

All public utilities are in a position to be materially harmed by an unfriendly public sentiment, while there is little danger of intentional damage being done by people who are friendly and in a good humor.

A company is represented by its employes, and its relations with the public depend largely, upon the relations on the individual employe with its patrons.

The broader and bigger an employe is, the more valuable he becomes to his employer.

Many telephone companies devote considerable attention to commercial employe relations and neglect educating those in other departments along these lines. It is a very common occurrence for those, thus neglected, to do and say things which are detrimental to the company from every point of view.

Traffic and plant employes, who are in almost constant touch with patrons, very often, carelessly or thoughtlessly, say something which any amount of effort cannot fully overcome. This same lack of relations formerly applied, to a certain extent, to commercial employes, and the wonderful improvement in the relations of these employes is due to a large extent to proper education and training.

Too much emphasis can hardly be given to the proper education and training of employes in their relations with one another and with the public. And telephone companies, can as a rule, profitably devote more attention and effort to bring about such very desirable results.

1,083,964 Telephones in Canada at Beginning of Year.

Telephones in Canada on December 31, 1924, numbered 1,083,964, compared with 1,022,782 in the previous year. This places Canada next to the United States in the number of telephones in use on a per capita basis.

By provinces the distribution was as follows: Quebec, 208,629; Ontario, 476,054; Prince Edward Island, 4,240; Nova Scotia, 30,265; New Brunswick, 28,307; Manitoba, 66,965; Saskatchewan, 98,065; Alberta, 67,657; British Columbia, 89,310; the Yukon, 380; unknown as unaccounted, 5,131.

Cuban Telephone Stockholders Asked to Ratify Bond Issue.

At a special meeting, September 3, stockholders of the Cuban Telephone Co. were asked to ratify the issuance of $25,000,000 debenture 5½ per cent bonds, convertible at 125 as of March 1, 1926.

Stockholders were also to vote on the issuance of 100,000 additional shares of stock at par, and on the issuance of 88,754 shares of capital stock in exchange for Cuban Telephone Co. bonds outstanding.

"10 Per Cent—10 Girls—10 Days"

10 Girls of Associated Companies of Abilene, Kans., of Which C. L. Brown Is President, Tell of Benefits Derived from 10 Per Cent Salary Savings Plan, and Enjoy 10 Days in Colorado at Mr. Brown's Personal Expense.

Early this summer President C. L. Brown of the United Telephone Co., Abilene, Kans., and Manager D. A. Van Trine, of Salina, were making a business trip by automobile. About two miles east of Salina Mr. Van Trine, directing Mr. Brown's attention to a cozy little cottage by the roadside, remarked, "The 10 per cent savings plan built that home."

Upon Mr. Brown's return to Abilene he was intensely interested in learning what the thrift plan, as observed in the United organizations, had done for the several other hundreds of company's girl employes.

Letters and posters were sent out asking that the girls write a personal letter to Mr. Brown telling him of how the savings plan had most benefited them. The poster announcement read:

"10 Girls—10 Days."

"Write a letter to C. L. Brown and tell him how the Thrift Plan as observed in his organization has helped you.

The ten girl employes who have been most benefited by this plan will be the ones to enjoy an automobile trip and ten days' outing to Clear Creek Canyon, near Georgetown and Silver Plume, Colo. All expenses will be paid by Mr. Brown.

During the three years, employes of the Associated Companies have saved practically half a million dollars. There have been numerous other benefits resulting from Mr. Brown's plan requiring all employes to save systematically at least 10 per cent of their income every month.

How have you been benefited by the plan? Did it help you to buy a home? Or pay off old debts? Or put aside a nice sum for a rainy day? Or did it help you in some other way?

Your letter to Mr. Brown should give the facts and state briefly the benefits that you have derived from the thrift plan.

Every girl employe of the following companies is eligible for the Colorado trip with all expenses paid: The United Telephone Co., The United Power & Light Corporation, The Central Kansas Telephone Co., The Central Kansas Power Co., The Union Electric Co., The United Oil & Refining Co., and The United Tractor System, and the Smith Center Light Plant.

All letters must be in the mail by midnight July 12. Winners will be announced July 20. The automobiles (Lincoln and Packard) will leave Abilene on August 5 and return August 15 or 16. Competent chaperones and a good cook will be provided.

Every girl should write a letter."

By midnight of July 12, 400 letters had been received, every one of them showing remarkable effort to meet the requirements of the company and containing many stories of self-sacrifice and accomplishment.

The girls chosen for the ten-day trip to Colorado were: Jessie Miller, Marysville; Lucille Harmon, Ellsworth; Lena Jordan, Oberlin; Artela Clark, Hutchinson; Laura Ball, Abilene; Lidwina Wasinger, Hays;

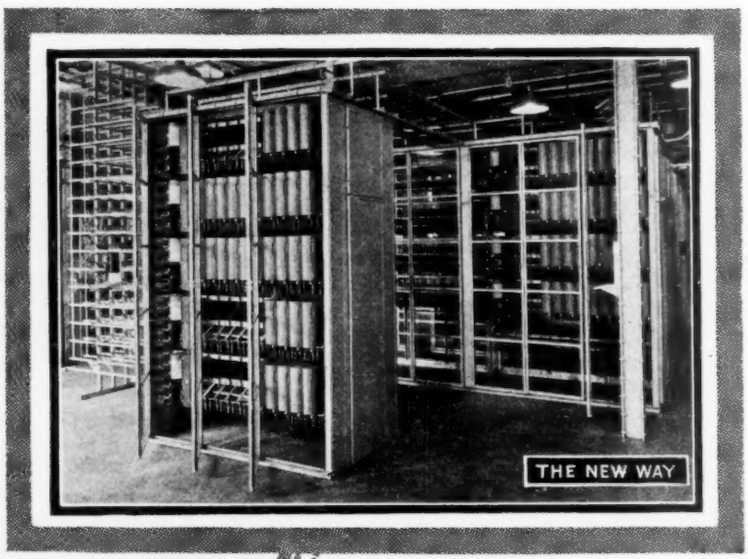
Anna Klassen, McPherson; Bessie Kidby, Clay Center; Hazel Miller, Salina, and Elsie Keyes, Manhattan.

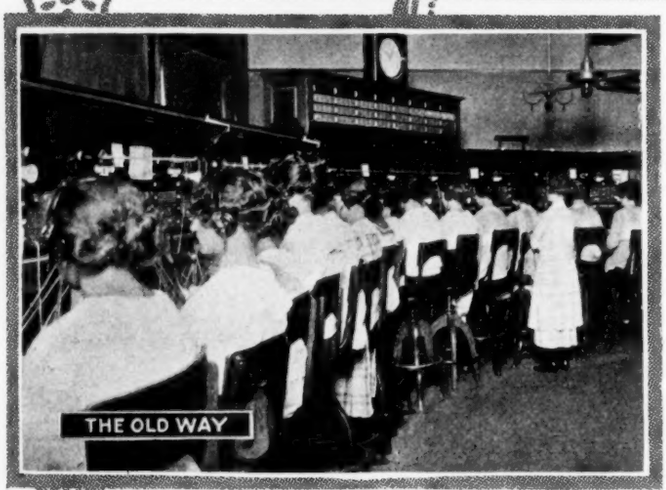
The judges selected to judge the letters were Charles M. Harger, editor of the Abilene Reflector; Roy F. Baily, editor of the Salina Evening Journal; and Fay N. Seaton, editor of the Manhattan Evening Mercury.

Here are some of the comments that the judges made:

"Here is my decision. I confess that I am not satisfied with the result, but I do not know how I could have done better. The letters all were good, and so I finally, after reading them three or four times, decided that I would have to take into consideration personal appeal, and their effectiveness in selling the idea to some outsider.

It is an interesting collection of letters,


THE NEW WAY


THE OLD WAY

ibers Who Know the New Way
Longer Content With the Old

traffic flowed in a steady stream in= reseen rushes; if telephone employes more pay, were never sick, and were in one position instead of seeking ; if people always spoke clearly and if human hands were never subject an minds to fatigue—

ld way of handling telephone calls n.

ne subscribers everywhere are fast inted with dial service. They know convenient, more accurate, that it inutes every day. In fact, they like atic service so well that in many indicated a willingness to pay a der to get it.

it pays telephone companies to ay—the Strowger Automatic way.

Forward = looking telephone companies are preparing now for Strowger Automatic operation by adopting Type 21 Common Battery telephones fitted with blank dial plates, the desk stand having the standard automatic offset stem. This means a substantial saving when conversion to automatic is finally made. Write for bulletin and prices.

tic Electric Company

nd General Offices: Chicago, Illinois

ASSOCIATED COMPANIES

Sales and Engineering Corporation.....New York
Telephone Company, Ltd.....London
fg. Co., Ltd.....Liverpool
ur l'Exploitation des Procédés Thomson-Houston...Paris
Ltd.....Sydney

and I think that I am in a position to understand the problems that many of these girls face, from the experiences of our own family in getting a start. That seems to me to be of such importance that I have given more stress to that idea than some of the other judges will do."—Roy F. Bailey.

"The group is so excellent that selection is difficult. I have made the decision on the element of human interest and service as well as on actual savings, believing that the great object attained has been the expression of helpfulness along with the lesson of thrift.

The letters show a remarkable effort to meet the requirements of the company and seem to evidence the possibility of saving even under the most untoward conditions. Many of the letters are touching in their story of sacrifice, and the young women certainly have accomplished much. It would be fine if all could be rewarded—but I feel that those who have been given the leading places actually presented the most valuable reports."—C. M. Harger.

"In undertaking to act as one of the judges of the '10 Girls—10 Days—10 Per Cent letters,' I undertook a hard job. However, I have done the best I can by these ladies, and have ranked them conscientiously as I see it.

In general I have felt that the girl most benefited by the savings plan is where the need to learn to save has been the greatest. A girl who never learned to save, it seems to me, benefits more from being taught, than does a girl who already has learned the lesson, and is merely encouraged in her saving."—Fay N. Seaton.

Every one of the letters received was interesting and many of them are touching in their story of sacrifice and accomplishment.

The following letters are typical of those that were received:

"Dear Mr. Brown: I have been reading the letters and placards regarding the 10 girls, 10-day trip to Colorado and think it the most enticing offer you could have possibly made.

The 10 per cent saving has certainly proved profitable to me. It has shown me that to save a definite sum you must start systematic saving now, and you'll soon be saving more than the 10 per cent. I had started saving a little before we were required to save the 10 per cent and knew it was what everybody should do, but thought I could never spare more than just enough to keep up the stock payments.

When the savings plan went into effect, I soon found that I could save 10 per cent just as well, and I'm paying about 15 per cent on United Telephone stock now, about 6 per cent on insurance and $5 a month on standard educational books. I will finish my third share in August. I pay for my board and room and have about $15 out on a personal loan.

In a little talk to the Business and Professional Women's Club a short time ago, under the topic 'Glimpses Into Business,' I told the girls about our savings plan and got two prospects for stock sales shortly after. They seemed to all think it was, indeed, a wise and considerate idea on the part of the company and I think it would be a great help to all concerned for any firm or company to adopt the same plan."

"Dear Mr. Brown: A wonderful opportunity you are offering the girl employes of the various companies and I, being one of the employes of the United Telephone Co., am writing you a short letter in regard to the 10 per cent savings plan.

Saving 10 per cent of my salary every month has been of much benefit to me; it helped me to finish my high school education.

I have been employed by the United Telephone Co. four years, and have been attending school at the same time, and also saved 10 per cent of my salary every month to pay for my school debt. I had borrowed money to pay for my tuition fees and other necessities. Several months ago I drew out my share, that I had paid up, and paid my debt, so now the school term is exhausted and I have finished (paid) my high-school education and am free from debt.

If I had not saved this 10 per cent as I had been doing, I would still owe this debt and would not have saved any money otherwise.

This savings plan has been of much benefit to me. It helped me a great deal at the time that I needed it most, and I shall continue this savings plan, for I expect to have it help me a great deal in the future."

On the morning of August 5 a jolly group of girls in three cars left Abilene for the ten-day outing. The trip was chaperoned by E. E. Belden, director of the public relations department; C. G. Van Doren, superintendent of the traction system; their wives; Mrs. Hazel Gamble, welfare worker, and Robert Gemmill, of Abilene.

Several days were spent in Denver and included a visit to the Denver telephone exchange, and then a trip was taken up Bear Creek Canyon to Georgetown. The girls stayed there three days, fishing and climbing mountains. One day was spent in a trip to Berthoud Pass, where a snowball battle was put on by the party.

From Georgetown, the Lookout Mountain drive was made, with visits at the Silver Fox farms and the grave of Buffalo Bill.

The balance of the time was spent at Colorado Springs and Manitou, seeing all points of interest, a trip to the top of Pike's Peak being included. The return to Abilene was made August 16.

The trip was financed by President C. L. Brown, personally. Mr. Brown started the 10 per cent compulsory saving plan in his telephone and power companies in 1922. During the past three years his employes have saved more than $500,000.

Eight Texas Independent Exchanges Merged.

With a capital stock of $335,000.00 The Northern Texas Telephone Co., owner of eight telephone exchanges with a total of 7,000 subscribers, is to make Sherman, Texas, its headquarters and C. A. Shock, of Sherman, is to be vice-president and general manager. Judge Frank C. Dillard, also of Sherman, is to be general attorney for the new corporation and Mrs. C. W. Embry, of Sherman, will be assistant treasurer and auditor.

The corporation will own and operate the telephone properties at Bonham, Denton, Pilot Point, Tioga, Collinsville, Whitesboro, Sherman and Howe.

The Northern Texas Telephone Co., according to Mr. Shock, was incorporated in the latter part of 1924, with headquarters at Sherman, to be used as a means of merging into one company the telephone properties located in Bonham, Denton, Pilot Point, Tioga, Collinsville, Whitesboro, Sherman and Howe. In addition to the Grayson Telephone Co. at Sherman, these other properties were formerly divided among three corporations, known as the Bonham Telephone Co., People's Home Telephone Co. and North Texas Telephone Co. During the present year all the properties, with the exception of the Grayson, have been transferred to the Northern Texas and their charters dissolved.

At meetings of the stockholders of the Grayson and Northern Texas companies in Waco, August 24, at which all the stock of both companies was represented, it was voted unanimously to sell the Grayson telephone properties in Sherman and Howe to the Northern Texas Telephone Co., the actual transfer to take place on September 1. At the same meeting it was voted to increase the capital stock of the Northern Texas Telephone Co. from its present capital of $175,000 to $335,000, and an amendment to its charter was filed with the secretary of state and granted on August 26.

The personnel of the official family of the Northern Texas Telephone Co. is as follows: J. B. Earle, Waco, president; C. A. Shock, Sherman, vice-president and general manager; J. G. Crane, Kansas City, vice-president; E. C. Blomeyer, Kansas City, vice-president; V. E. Chaney, Kansas City, secretary; C. A. Bennett, Kansas City, treasurer; Mrs. C. W. Embry, Sherman, assistant treasurer; F. C. Dillard, Sherman, general attorney.

Mr. Shock has been in direct charge of the local company's business in Sherman for almost 22 years.

The Post Office and the Automatic

Subscriber's Automatic Set and Operation of Various Types of Subscriber's Dials—Rates for Automatic Service—Progress of Exchange Construction—Paper Presented Before British Institution of Electrical Engineers—Final Installment

By Col. T. F. Purves, O. B. E.,
Chief Engineer, British Post Office

The earliest Post Office automatic exchange areas were equipped with subscribers' apparatus supplied by the contractor whose exchange system was in use in each particular area. This led to the introduction of various types of instrument circuits and calling dials developed to suit the characteristics of the various systems.

Subscriber's Automatic Telephone Set.

The first circuit employed was that of the Automatic Electric Co. in which the talking current from the exchange circulated directly through the transmitter and receiver in simple series; the receiver was of the electromagnetic type, i. e., it had no permanent magnet but was magnetized by the exchange current. This is an admirably simple circuit, but investigation showed its grade of speech transmission to be somewhat inferior to that of the standard common battery circuit, which was utilized in connection with the automatic systems supplied by the Western Electric Co. and Siemens Brothers.

Another consideration in favor of the latter is that its adoption greatly facilitates conversion of standard common battery manual exchange telephones to automatic working. When the question of standardization of subscribers' automatic telephones arose, the electromagnetic system was, therefore, discarded and the standard common battery telephone circuit was adhered to.

Standard Impulse.

After consultation with the contractors responsible for the principal systems, a standard impulse suitable for all types of exchange equipment was agreed upon. This was defined as a "break" period followed by a "make" period in the ratio of 2 : 1, i. e., the break occupies two-thirds of the total impulse period.

In practice, dials are accepted if the "break" period comes within a range of 63 per cent to 70 per cent of the total. The standard rate of delivery of impulses is fixed at 10 impulse periods per second.

All subscribers' dials are carefully maintained to function at this speed, but in order to reduce dialing time and to speed up operating, the dials used by operators on manual switchboards are specially adjusted to deliver impulses at the rate of 10.5 to 12 per second. The impulsing mechanism is only in operation during the return journey of the finger-hole disk after its release by the finger, so that the rate of impulsing is independent of any human factor.

Standard Dial.

Following on the standardization of the impulse, the provision of a standard dial for universal use was taken in hand and developed in association with all the Post Office exchange contractors. The dial produced as a result of these efforts is illustrated in Fig. 22.

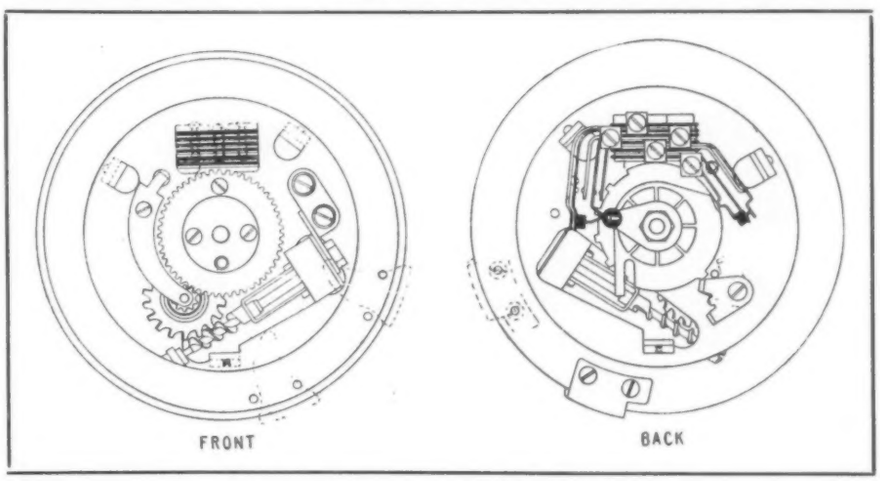


Fig. 22. P. O. Standard Automatic Dial.

At the rear of the dial a circular disk with 10 recessed gaps rotates in unison with the front finger plate. A spring, riding on the periphery of this disk, actuates a pair of contact springs which break and make a normally-closed circuit as the spring rides in and out of the gaps when the disk rotates.

These are the impulsing springs proper and it might here be noted that this device, which secures the springs being pushed into contact for the "make" portion of the impulse and allows them to fall apart for the "break," eliminates "contact bounce" and gives a much cleaner impulse than the earlier device in which two contact springs normally held together by their own resilience were forced apart to give the break portion of the impulse, and allowed to fall together for the make portion.

During the forward rotation of the dial the riding spring is prevented from falling into the gaps in the circular disk by means of a friction sliding-cover plate, so that the impulsing springs are unaffected. The gaps in the disk are so spaced that they do not come into action until a certain portion of the return journey has been traversed. This provides an interval between the receipt of successive trains of impulses which gives the switching mechanism at the exchange ample time to perform its "trunk-hunting" operation after each train.

Systems in which the call is first stored at the exchange on quick-acting registers, and subsequently released through the mechanism, do not require this hunting interval, and provision is, therefore, made on the dial for placing the finger-stop in an alternative position which reduces the length of pull for each digit and so speeds up the action of the dial.

In addition to the impulsing springs, the dial also includes a set of auxiliary contact springs which make certain desired local changes in the circuit of the telephone while the dial is being operated. These springs are held in their normal position by an insulated stud attached to the circular disk. They assume the "operated" position as soon as the rotation of the disk begins, and maintain it until the disk has again come to rest in its normal position.

The speed at which a dial returns to normal under the influence of its restoring spring, and consequently the rate at which its impulses are delivered, is "governed" by means of a geared centrifugal friction break whose retarding effect increases proportionately with its speed.

Complete Instrument Circuit.

The inclusion of the dial in the circuit of a subscriber's telephone can be effected in several ways, and the selection of the most suitable circuit arrangement has been

by no means easy. The operation of the dial effects a rapid succession of interruptions in a circuit which includes exchange relays having considerable inductance.

In the absence of special precautions, these interruptions are accompanied by inductive surges or "kicks" which may run up to peaks of 500 or 600 volts and impose destructive strain on the insulation of instrument or exchange circuit wiring.

Other possible troubles arise from the alternate charging and discharging of the condenser in the bell circuit, which will cause the bell to tinkle in response to each train of impulses, and from the series of disconcerting clicks which may be heard in a subscriber's receiver while the impulses are passing.

The high dialing voltage can be materially reduced if the wiring be so arranged as to connect the condenser of the telephone across the break contacts of the dial during its operation.

The irregular tinkling of bells is always a nuisance and becomes a serious defect in the working of extension circuits, since the tinkling of the main station bell, when an extension station dials a number, is liable to be mistaken for an ordinary ring. For this reason it has hitherto been necessary to "bias" all bells used on automatic telephone sets, in the endeavor to obtain adequate security against tinkling under all conditions.

The bell is "biased" by fixing an adjustable spring to the armature in such a way as to hold it normally over to one side, with the bell hammer resting against one gong. This gong must be the one which the hammer would strike when responding to tinkling impulses, in order that the impulses — which are always in the same direction — will have no audible effect on the bell.

The addition of the "bias" spring not only represents an additional item of expense, in regard both to first cost and maintenance cost, but materially reduces the reliability of the bell. Any accidental reversal of the line connections renders it ineffective, and this remedy for tinkling can only be regarded as the lesser of two evils. The latest circuit arrangement overcomes the need for biasing and is greatly to be preferred.

Clicks in subscribers' receivers are obviated in all modern circuits by arranging for the auxiliary contact springs on the dial to short-circuit or disconnect the receiver during the operation of dialing.

Fig. 23 shows several circuits which have already been employed in order to reduce the undesirable local effects of dialing, and illustrates the successive stages in the development of the present standard circuit, in which they are all successfully overcome. It will be remembered that dialing takes place when the receiver is off the hook.

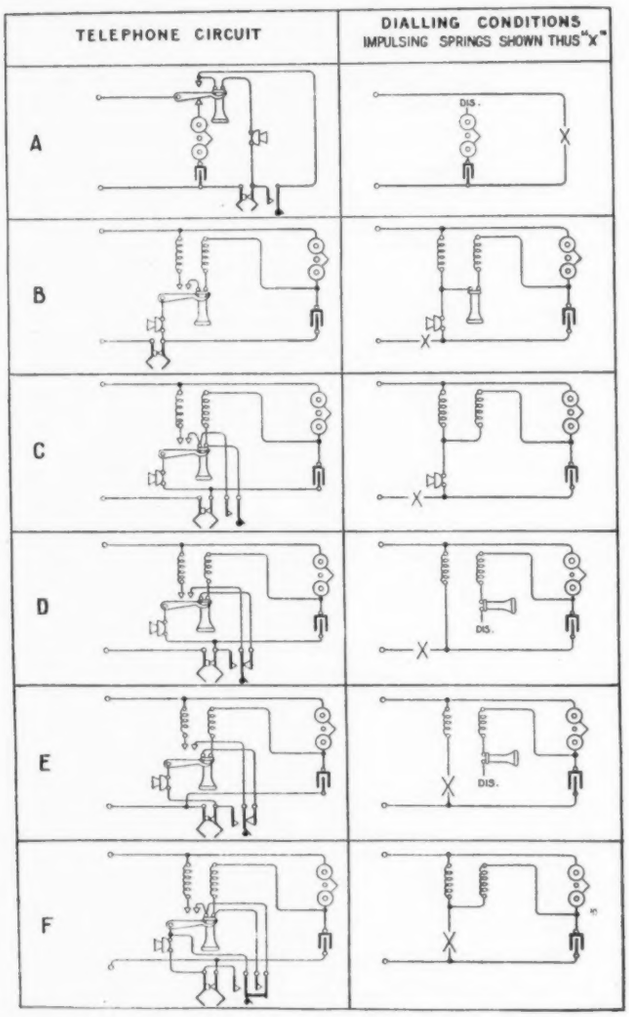


Fig. 23. Development of the Subscriber's Automatic Telephone Circuit.

Fig. 23-*A* shows the Automatic Electric Co.'s original circuit employing the electromagnetic receiver without induction coil. The bell is cut out of circuit during the process of dialing, and is, therefore, not subject to tinkling insofar as the action of its own dial is concerned. If, however., more than two telephones are connected to the same line, the main station bell is subject to tinkling when an extension station dials.

No attempt is made in this circuit to suppress the high inductive dialing "kick," and high-grade insulation is, therefore, needed in all wiring. The auxiliary springs on the dial automatically short-circuit the transmitter and receiver during the period the dial is in motion, so that no clicks are heard.

Fig. 23-*B* shows the earliest circuit of the Western Electric Co. which was applied to a standard common battery instrument with induction coil, and utilized a dial without auxiliary springs. It affords standard transmission, dials through the transmitter, and allows the subscriber to hear loud dialing clicks in the receiver. The dial is placed in series with the line circuit.

The condenser is alternately charged and discharged as the dial springs make and break, but the presence of the induction coil and transmitter and receiver in bridge across the condenser reduces the magnitude of the charge and provides a discharge path clear of the bell, which is consequently immune from tinkling. It also involves the use of a four-conductor cord between the table telephone and the bell box, in place of the standard three-conductor cord.

Fig. 23-*C* shows a more recent circuit provided for the Post Office by the Western Electric Co. It is identical with the circuit shown in Fig. 23-*B* but includes two auxiliary springs, which short-circuit the receiver while dialing is in progress and prevent the subscriber from hearing dialing clicks. A four-conductor cord is required.

Fig. 23-*D* shows a circuit provided by Siemens Brothers. It is very similar to that of Figs. 23-*B* and *C*, but the auxiliary springs short-circuit the transmitter and disconnect the receiver. The condenser is alternately charged and discharged as the dial springs make and break, but the magnitude of the charge is small because the condenser is charged through the high impedance of the 1,000-ohm bell and is shunted, at the moment of charge, by the primary (17-ohm) winding of the induction coil.

The whole of the discharge current flows through the bell but is insufficient to cause tinkling. A four-conductor cord is required.

Fig. 23-*E* shows an arrangement which is used in some of the more recent installations in this country and is, I think, still the standard circuit of the American Telephone & Telegraph Co. Its chief advantage lies in the fact that it introduces a dial into the standard common battery telephone without the need for more than three conductors in the cord to the desk set.

The bell and condenser are connected permanently across the line, and the condenser serves to absorb high-voltage kicks during the dial operation, but its efficiency

in that respect is reduced by the high impedance of the bell in series with it. The voltage across the condenser is alternately increased and decreased, as the dial springs break and make, and the bell is subjected to the full force of its charge and discharge. The bell, therefore, requires to be effectively biased in order to suppress tinkling.

Fig. 23-*F* illustrates the arrangement and connections of the auxiliary contact springs in the new Post Office standard circuit—with three-conductor cord. This circuit secures immunity from tinkling without resorting to biasing, and suppresses—or at any rate reduces to a negligible quantity—the high inductive dialing kick.

When dialing is proceeding, the condenser is bridged in series with the secondary 26-ohm winding of the induction coil across the "break" springs of the dial, in which position it momentarily prolongs the current after "break" and effectually prevents the high-voltage surge from the exchange apparatus from reaching a dangerous peak, while at the same time its action—as it is in series with only the low impedance of the induction-coil windings—is so rapid that no troublesome amount of impulse distortion is introduced.

Immunity from tinkling is secured, as in Fig. 23-*C*, by providing for the condenser to discharge mainly through the windings of the induction coil, which act as a shunt upon the bell. Dialing clicks are eliminated by short-circuiting the receiver. A separate pair of auxiliary contact springs is used to short-circuit the transmitter also, in order that constant dialing conditions may be maintained notwithstanding any alterations which it may in future be found desirable to make in the mean resistance of the standard transmitter.

The adoption of this very satisfactory instrument circuit was made possible by the fact that the new standard dial provides a robust and positive method of actuating the auxiliary contact springs. Springs which would short-circuit both the transmitter and receiver would undoubtedly have been employed several years ago but for the fact that one hesitated to attach to the earlier types of dial a spring set with more than one moving member.

The spring set now used includes two separate moving members, and they are actuated in a manner which is, I think, safe and certain. Unfortunately this possible feature of the standard dial was not at once noticed, and those first obtained were fitted with spring sets of the then standard type, as shown in Fig. 23-*E*. It has, however, been possible to arrange that all on order for the London automatic service shall be converted to the new type in the course of their manufacture. The economy which will be effected in London alone, by obviating the need for fitting biased bells, is estimated to approach £100,000.

It will generally be admitted that the modern automatic calling dial is a remarkably simple little piece of apparatus, as compared with the immense complexity of the machine which it controls. This simplicity is the result of a long period of evolution since someone in the Automatic Electric Co. first had the happy thought of making a rotating disk with finger-holes

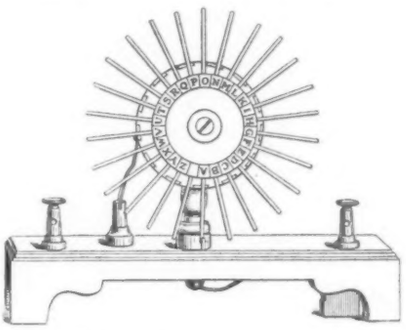


Fig. 24. ABC Dial Sender.

for the purpose of sending the trains of impulses required for the Strowger automatic system.

The master patent, which secured a monopoly for this device, ran from 1898 to 1912, and during that period a great deal of ingenuity was extended in inventing competing forms of dials and other signaling devices for other automatic systems which would not infringe the patent. It may be of interest to state that throughout this period an old and forgotten telegraph transmitting device was in existence which, in all essential respects, anticipated the terms of the master patent. This was one of the earliest forms, if not the earliest form of transmitter used in connection with the Wheatstone ABC telegraph system.

A "clear-up" in one of the old storerooms of the General Post Office in 1913 unearthed a specimen of this apparatus marked "Cooke and Wheatstone 1839" (see Fig. 24.) It includes a disk provided with pivotally-arranged finger-holds, which can be rotated from any position to a fixed finger-stop, for the purpose of transmitting, by means of a current-making-and-breaking device, a predetermined number of impulses of electric current, in harmony with the finger-holds—all of which terms represent the explicit claims of the master patent, so long considered unassailable. When it was discovered and brought to me as an interesting telegraph relic the patent had just expired.

Tariffs for Automatic Systems.

The "message rate" tariff now in force in the British Post Office telephone service represents the only strictly equitable basis of general charge for such a service. It has the advantage of placing the small and large user on precisely the same footing, inasmuch as each will pay for his service in proportion to the broadly averaged overall cost of providing it and the use he makes of it.

Under this method a fixed sum known as the installation rental is paid annually by the subscriber in respect of the plant provided for his individual use, and a uniform fee for each effective local call is collected to cover the cost of the plant provided for the common use of all subscribers, and the cost of operating. Additional charges are levied on a radial mileage basis for the use of long junction and trunk plant, affording connection with places outside the local fee area.

It is sometimes argued that the general introduction of the automatic system, and the elimination of the cost of operators to handle local calls, will bring in new conditions which would justify the restoration of the "flat rate," which connotes a uniform charge to all subscribers of a particular class, independent of the number of calls originated by each of them.

This argument shows an entire misconception of the facts of the case. The introduction of the flat rate in connection with an automatic system would, of course, simplify the mechanical plant by making it unnecessary to provide metering arrangements for the registration of local calls, and would save a large part of the cost of collecting revenue from subscribers, but these points apply with at least equal force to the manual system, and in both cases they have to be subordinated to much more important considerations.

In the automatic system, as in the manual system, part of the plant is provided for the individual equipment of each subscriber's line and part for the common service of all subscribers. The second part, which in all busy exchanges is much the larger of the two, depends entirely upon the amount of traffic to be carried; it has therefore no association with the annual installation rental, and a due proportion of its cost can only be properly charged against each subscriber in accordance with the traffic he originates.

In a typical city manual exchange the ratio of individual to common service plant is about 1 to 2½; in an automatic exchange carrying equal traffic it is about 1 to 5. The actual cost per line of automatic plant in a busy city exchange is two or three times as much as in a suburban exchange forming part of the same system but having an average calling rate proportionately lower.

At present only the local unit fee per message is registered electrically on the subscribers' meters in automatic exchanges, and all charges for calls beyond the local fee area are manually recorded on tickets by operators. It is, however, probable that in the near future it may be convenient to extend automatic metering to calls for which double or treble the unit fee is chargeable, and so enlarge the effective areas to which a purely automatic system of working can be applied.

Schemes which provide, more or less

satisfactorily, for such differential metering have already been devised, and the Post Office has been careful to keep the way open for future development in this direction by clearing all odd calculations out of its message tariff. All mileage fees are now so graded that the charge for any distance is an even multiple of the local unit fee, and could, therefore, be registered by adding a corresponding number of units to the record on the subscriber's meter.

One important respect in which the tariff considerations applying to the automatic and manual systems differ is that in the former the duration, or "holding time," of a call has a much more important effect upon the cost of providing the service.

In both systems, switching and junction plant has to be provided on the basis of "traffic units," representing number of calls multiplied by holding time, but in the manual system the plant cost is rather overshadowed by the cost of operating the calls. The overall cost of providing service depends, therefore, to a much greater extent upon the number of calls than upon their duration, and no great error is made by assuming that all subscribers make calls of the same average duration.

With the automatic system, on the other hand, the plant cost factor is of paramount importance. The various selecting switches through which a call passes may be looked upon as operators who have not only to make the connection in the first instance but are each required to give it their exclusive attention as long as it lasts. An exception to this is the "director" which will be used in London merely for the purpose of setting up calls, but the cost of directors is a very small fraction of that of the total traffic-handling plant.

It results, therefore, that the cost of providing service to any subscriber depends upon the aggregate duration of his calls in the busy hour, and not upon their number. One call of an hour's duration will cost the system practically as much as 60 consecutive calls of one minute each. Under automatic conditions there is much to be said for the introduction of a method of charging for all telephone service on a time-and-distance basis, and the development of time-measuring methods applicable to local exchange working has received a good deal of attention from engineers.

Several patents already cover the application of this principle in such a manner that, immediately on the reply of the called subscriber, the meter of the originating subscriber will register one or more units in accordance with the distance between the parties, and repeat the registration at the end of each period of, say, three minutes. This does not fit in very well with the adoption of varying charges at different periods of the day and night, which is also a reasonable thing in telephony from the standpoint of keeping the plant occupied

Appendix 1.

Comparative statement showing estimated costs under manual and automatic systems, Keighley Exchange.

(a) Busy-hour calling rate 1
(b) Proportion of local traffic ..... 60 per cent
(c) Proportion of manual positions retained under automatic 60 per cent

	—1925—		—1930—		1935 (1,260 lines)	
	Manual.	Auto-matic.	Manual.	Auto-matic.	Manual.	Auto-matic.
Capital outlay:	£	£	£	£	£	£
Exchange equipment	7,490	13,854	8,803	16,562	10,095	18,717
Subscribers' apparatus	4,704	5,009	5,725	6,253	6,673	7,429
	12,194	18,863	14,528	22,815	16,768	26,146
Annual costs:						
Interest	671	1,037	799	1,255	922	1,438
Depreciation	636	718	760	876	878	1,013
Maintenance	1,303	1,405	1,456	1,547	1,744	1,849
Operating	2,053	1,545	2,294	1,564	2,595	1,764
Total annual costs	4,663	4,705	5,309	5,242	6,139	6,064
Balance of annual costs in favor of manual	42	.....	.....	.....	.....	.....
Balance of annual costs in favor of automatic	.....	.....	.....	67	.....	75

Costs which are common to both manual and automatic systems have been omitted from this statement.

Comparative statement showing estimated costs under manual and automatic systems, Maidstone Exchange.

(a) Busy-hour calling rate 0.7
(b) Proportion of local traffic ..... 70 per cent
(c) Proportion of manual positions retained under automatic 28 per cent

	—1926—		—1931—		1936 (1,550 lines)	
	Manual.	Auto-matic.	Manual.	Auto-matic.	Manual.	Auto-matic.
Capital cost:	£	£	£	£	£	£
Exchange equipment	8,458	14,068	11,346	19,073	13,744	22,315
Subscribers' apparatus	4,388	4,944	6,449	7,210	8,340	9,288
	12,846	19,012	17,795	26,283	22,084	31,603
Annual costs:						
Interest	626	927	868	1,281	1,077	1,541
Depreciation	685	757	956	1,060	1,192	1,296
Maintenance	1,526	1,722	2,186	2,466	2,822	3,186
Operating	1,390	535	1,865	764	2,526	1,136
Total annual costs	4,227	3,941	5,875	5,571	7,617	7,159
Balance of annual costs in favor of automatic	.....	286	.....	304	.....	458

Costs which are common to both manual and automatic systems have been omitted from this statement.

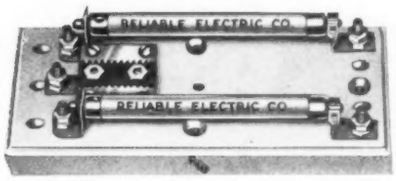
Comparative statement showing estimated costs under manual and automatic systems, Macclesfield and Prestbury Exchanges.

(a) Busy-hour calling rate 0.8
(b) Proportion of local traffic ..... 75 per cent
(c) Proportion of manual positions retained under automatic 53 per cent

	—1925—		—1930—		1935 (875 lines)	
	Manual.	Auto-matic.	Manual.	Auto-matic.	Manual.	Auto-matic.
Capital outlay:	£	£	£	£	£	£
Exchange equipment	4,694	10,723	5,951	13,345	6,507	14,964
Subscribers' apparatus	3,261	3,433	4,472	4,890	5,248	5,822
	7,955	14,156	10,423	18,235	11,755	20,786
Annual costs:						
Interest	438	779	573	1,003	647	1,143
Depreciation	419	511	552	697	627	802
Maintenance	784	811	971	1,015	1,156	1,205
Operating	734	480	876	549	1,183	573
Total annual costs	2,375	2,581	2,972	3,264	3,613	3,723
Balance of annual costs in favor of manual	206	.....	292	.....	110	.....

Against the balance in favor of manual working shown in the statement, there will be an annual saving of £220 on line plant by the use of automatic.

FOR SERVICE



No. 998C Arrester

Newly designed self-cleaning telephone protector of the Saw-tooth type, equipped with standard fuses $4\frac{3}{4}$" long, shoulder to shoulder; all over metal cover, lead in wires enter through the porcelain base.

Fuse clips, made of phosphor bronze, insure long life and perfect electrical contact.

Samples and prices furnished on request

Reliable Electric Company

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and revenue-earning outside the normally busy hours.

A preferable system would appear to be record normal time units by metering impulses at short intervals of, say, twelve seconds throughout the period of connection, counting 10 or 12 units as the equivalent of a penny call. For calls to points outside the local area, the record might be made at double, triple, or quadruple speed, by drawing impulses from different contact cams in the controlling clock. Reduced tariffs during normally slack periods could be introduced by variable driving gear which would slow down the whole impulse system in as many stages as might be desired.

The character of the new automatic exchanges to be catered for in London and the provinces in the immediate future is shown in Appendix 2. It will be observed that the schedule includes 161 projected exchanges with a capacity of about 368,000 subscribers' lines. Before this large amount of work can be completed, many additional requirements will no doubt have matured. Extensions of existing provincial automatic exchanges will also be necessary in order to meet development.

The steps taken to provide for the special telephonic needs of London and to encourage British manufacturers to make plant of uniform characteristics have already been mentioned.

The difficult matter of acquiring sites, at or near the positions indicated by economic studies of the area layout, and designing and providing the necessary buildings, is proceeding as rapidly as present conditions allow. The contractors concerned in the manufacture of the exchange equipment are all working hard to produce and install the plant by the dates required, and their staffs of able engineers are in continuous touch with the Post Office engineering department.

The Post Office staff responsible for planning and providing the external cable plant, and for grafting it economically into the London cable network, is also working strenuously under conditions rendered more and more difficult by the rapidly-increasing congestion of underground London and the necessity for reducing street openings to the utmost possible extent. In some central districts it is no longer possible to find space for the necessary cable ducts under footways and roadways, and tunneling deep down in the London clay has to be resorted to in order to gain adequate access to exchanges.

Automatic developments on so large a scale necessitate also the provision of a very highly skilled staff to engineer, supervise and maintain the exchanges. In order to meet this great need, it has been found desirable to set up a very completely equipped training school at the General Post Office for the purpose of giving a thorough training to the staff of the engineering department in the theory and practice of automatic telephony, and in the delicate work of switch adjustment, fault tracing and cognate matters. Graduated courses of instruction are held for the skilled workmen who will actually maintain the exchanges, as well as for inspectors and engineers who will be responsible for the performance of the mechanism and the efficiency of the service rendered.

The extreme complexity of modern automatic circuits and equipment is illustrated by the fact that a single automatic switching unit of 10,000 lines comprises no less than 5,000,000 "bank" contacts representing selectable outlets. Any one subscriber in such a unit can obtain connection with any other particular subscriber in the same unit via more than 240,000 different linkages. To reach all the subscribers on the unit he has at his disposal more than 2,400,000,000 different linkages without passing outside his own exchange of 10,000 lines.

In his recent book, "Fifty Years of Electricity," Dr. Fleming expressed the opinion that the design of modern automatic telephone systems represented "the high water mark of human creative power." Be this as it may, it seems improbable that a parallel could be found, in any other application of science to industry, to the mass of coordinated and controlled complexity constituted by the automatic machine required to meet the telephonic needs of such cities as New York and London.

The manufacturing organization necessary for the production of the automatic equipment needed throughout the Empire, and in foreign markets which British manufacturers have been able to secure, is very vast and complex. It is anticipated that, in the near future, an annual output of automatic equipment for a quarter of a million exchange lines will be producible in the factories of this country.

From the first inception of the Post Office telephone system it has been the policy of the department to discontinue the purchase of telephone plant from abroad and to encourage the establishment, within the United Kingdom, of adequate manufacturing resources for the supply of all its needs. It was well recognized from the first that this would foster the setting up of a British industry which would cater for a far more extensive market than that represented by Post Office requirements, and the complete success of this policy is a matter for lively satisfaction.

Appendix 2.

Proposed New Automatic Exchanges:

LONDON Name of Exchange.	Approximate No. of Lines
Beckenham	1,600
Bermondsey	2,000
Bishopsgate	8,400
Central	10,000
City	4,400
Cricklewood	3,000
Croydon	4,000
Edgware	1,000
Fulham	4,000
Guildhall	10,000
Hampstead	3,800
Hendon	1,500
Holborn	9,400
Holloway	2,000
Ilford	2,500
Kensington	6,000
Kentish Town	2,700
King's Cross	3,000
Langham	7,600
Maida Vale	6,000
Monument	10,000
Oval	2,000
Primrose Hill	4,700
Sloane	8,000
Strand	7,400
Tandem	....
Thornton Heath	1,000
Wandsworth	3,000
Western	6,800
Whitehall	10,000
Wood Street	10,000
Woodside Park	2,000
Total, 32 Exchanges	157,800

PROVINCES Name of Area.	No. of Exchanges.	Total No. of Lines
Bath	4	4,000
Bedford	1	1,500
Birmingham	5	20,000
Brighton	6	8,500
Bristol	5	8,000
Burnley	1	1,700
Chatham	4	2,000
Cheltenham	2	1,400
Chesterfield	2	1,100
Colchester	1	1,000
Colwyn Bay	2	3,000
Coventry	2	3,500
Dudley	4	3,000
Edinburgh	4	15,600
Exeter	2	2,000
Folkestone	4	2,000
Gloucester	1	1,200
Halifax	1	3,200
Hanley	7	4,300
Harrogate	1	2,600
Hereford	1	1,000
Ipswich	1	1,300
Keighley	2	2,000
Kirkaldy	1	800
Leeds	4	4,000
Leicester	4	9,300
Liverpool	1	10,000
Macclesfield	2	2,000
Manchester	5	20,000
Newcastle	5	12,000
Nottingham	4	11,000
Oxford	1	1,400
Plymouth	2	4,000
Portsmouth	1	600
Rochdale	8	3,700
Sheffield	9	13,300
Shrewsbury	1	1,000
Southend	3	4,000
Southport	4	7,100
Torquay	2	1,800
Wakefield	2	2,000
Walsall	2	2,000
Watford	1	2,000
West Hartlepool	2	1,400
Wolverhampton	2	3,000
Total, 45 Areas	129	210,300

Telegrams Accepted From Pay Stations in England.

The postal authorities in Leeds, England, have inaugurated the acceptance of telegrams through ordinary slot-meter telephone call boxes, the user paying the telephone call and telegram fees into the box in pennie. Liverpool followed suit August 1, and the scheme, which is being tried in Manchester, will be extended if successful.

It Takes a Bite to Tell

A flawless skin may conceal imperfection of fruit or flavor. The final test is a trial taste.

A telephone battery is much the same. The external appearance is no indication of the service it will give. The parts you cannot see are the most important.

That is why so many telephone company executives have standardized on French Telephone Batteries. Long experience in the trials of actual use have convinced them that the hidden parts of French Batteries can be relied upon for consistent, dependable service.

FRENCH BATTERY COMPANY
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Also makers of French Ray-O-Vac Batteries.
Eleven models cover every radio use.

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Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchise, Rates and Service

Hearing on Indiana Bell State-Wide Investigation September 28.

The hearing before the Indiana Public Service Commission on the state-wide survey for the purpose of fixing a valuation and rates for the Indiana Bell Telephone Co. throughout the state will begin before Samuel R. Artman, member of the commission, September 28, instead of September 1, as was agreed on originally. The postponement of the date for the hearing was made necessary in order to permit the completion of some of the necessary details in the survey.

Commission Allows Increase and Orders Depreciation Fund.

The Center Telephone Co., of Center, Ind., has been granted authority by the Indiana Public Service Commission to place in effect a new and revised schedule of rates and to make certain changes in its method of operation. Hearing on the petition of the company, which was not contested, was held in Kokomo on July 22.

The following table of fixed charges per month has been authorized: Individual line, business, $2.00 net, $2.15 gross; individual line, residence, net, $1.75, gross, $1.90; party line, business, net, $1.75, gross, $1.90; party line, residence, net, $1.00, gross, $1.15; extension line, 50 cents. Patrons who own and maintain their own lines and instruments shall be given a discount of 15 cents per month from the net rate. All rates shall include free service with Sharpsville, Windfall and Greentown exchanges.

A toll charge of ten cents for three minutes or fraction thereof shall be made to Kokomo exchange. Non-patrons shall be required to pay a toll charge of 10 cents for three minutes or fraction thereof to Sharpsville, Windfall or Greentown.

The company was directed to set aside $200 each year as a depreciation fund. All charges are to be paid quarterly.

Michigan Bell Files Application for State-Wide Rate Increase.

The formal petition of the Michigan Bell Telephone Co. for increased rates in practically all sections of Michigan was filed with the Michigan Public Utilities Commission August 20. In most cities with a population of 10,000 or more the company asks for increases to rates higher than were recommended by the state's engineers in their report filed with the commission several months ago.

The company, to comply with the state law, a few weeks ago posted advertisements announcing that the formal petition for an increase would be filed.

In brief, the company asks:

First, that the temporary cut in Detroit rates of 2½ per cent made last January be cancelled and the old rates in force January 1, 1925, be established.

Second, that the commission ignore the report of its chief engineer, Manfred K. Toeppen, who has recommended that Detroit telephone rates be reduced still more.

Third, that Royal Oak be advanced from the seventh to the sixth district, which means an increase of $1.50 a month for business telephones and 50 cents a month for residence telephones.

Fourth, that Birmingham, Dearborn and Redford be advanced from the eighth to the seventh district, which means an increase of 75 cents a month for business telephones and 25 cents a month for residence telephones.

Fifth, that Roseville be advanced from the ninth to the eighth district, which means an increase of $1.25 a month for business telephones and 75 cents a month for residence telephones.

Sixth, that business telephone rates throughout the state, excepting in communities of less than 10,000 persons, be increased $6 a year, and that a boost of 25 cents a month be put into effect for Grand Rapids residence telephones.

The commission set September 8 for the hearing, when the company's plea will be considered along with the general readjustment of telephone rates recommended by the commission's engineers.

Engineer M. K. Toeppen's report, filed some time ago, recommends that rates in Detroit be reduced 5.2 per cent and that out-state rates be increased an average of 17 per cent. His figures are based on an appraisal and inventory recently completed, and upon the theory that each exchange should carry its own load and earn its own profit. It also coincides with a recent supreme court decision, which fixed depreciation and going value percentages. Detroit's excess rates since the first of the year totalled around $730,000, the report said. Part of this surplus already has been taken care of by the 2½ per cent reduction made last January.

Mr. Toeppen's recommendations also included a provision that excess telephone calls on business lines and on one-party residence telephone be reduced from 4½ to 4 cents. This is objected to by the company, which seeks to place all excess calls back at 4½ cents.

Asks Authority to Purchase Farmers' Company.

The Madison Telephone Co. has made formal application to the Nebraska State Railway Commission for permission to purchase the Madison County Farmers Telephone Co., the details of which were recently printed. The company also asks permission to put in gross rates 25 cents a month in excess of the net rates on town and 75 cents a quarter in excess of the net quarterly rates on farm service on the Tilden exchange recently purchased from a local company, these not to apply to switching service.

Nebraska Commission Has Important Hearings This Month.

Three important telephone hearings are on the docket of the Nebraska State Railway Commission for September. On the 8th it will hear the application of the Lincoln Telephone & Telegraph Co. for permission to close its exchange at Sprague, where it has but four subscribers. All four are protesting vigorously.

On September 2 it heard at Red Cloud the application of the Farmers Independent Telephone Co. for purchase of and consolidation with the local exchange of the Lincoln company, and for authority to issue $25,000 additional stock to finance the work.

On September 24 it will hear the application of the Blair Telephone Co. for a complete reorganization and refinancing as a preliminary to taking over the property in Blair of the Northwestern Bell company.

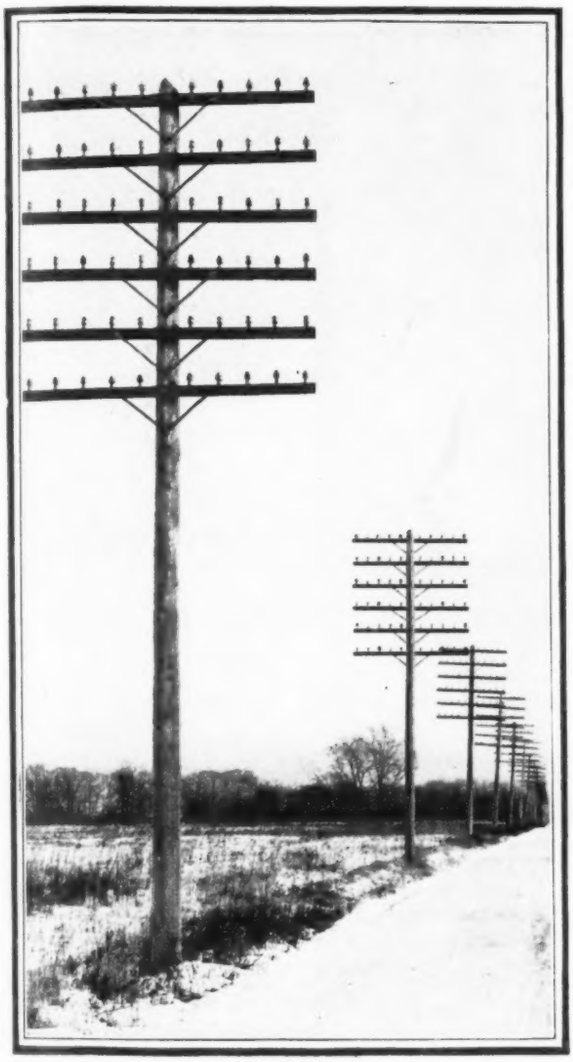
Commissioner Browne of Nebraska Argues Against No Par Stock.

State Railway Commissioner Thorne A. Browne of the Nebraska regulatory body took strong grounds against the issuance of no par stock by public utilities, in an address delivered on August 31 before the American Bar Association at Detroit. He said in part:

"I do not know but that the peculiar nature of public utilities in their relation to the general public and the interest of the general public in the financial integrity of the public utilities that serve them in more or less monopolistic way, warrants a more careful consideration of the advisability of no par stock than is the case for industrial organizations.

Customer ownership is being urged as a highly advisable method of keeping in touch with the public and making the public more nearly familiar with the financial and operating problems of public utilities.

Before you buy POLES—See Weyerhaeuser



A line of forty-foot Weyerhaeuser Idaho Red Cedar Poles set in 1924 by a Pennsylvania telephone company. These are a typical example of the kind of poles supplied by this organization. Weyerhaeuser men do not claim to have the only good poles on the market but they do pride themselves on the high quality and uniformity of all the poles they deliver—the result of careful selection of timber, minute attention to all details of manufacture and rigid inspections.

Remembering the Buyer *After* the Order Is Taken

AN Oregon power company, in appreciation for exceptional service rendered, writes:

"We wish to again express our appreciation of your efforts in getting these poles on the road for us, together with your very careful attention and advice regarding their movements en route."

A prominent middle west railroad writes:

"Wish to advise that we appreciate very much the prompt handling you have given these orders as the material was badly needed."

Such letters as these—and there are many more in the files—are the outgrowth of the Weyerhaeuser policy of building up a clientele of permanent customers.

Here it is not considered enough merely to make and supply good poles. Personal attention is given to every detail of the business by experienced pole men.

Poles are a specialty with this organization which is among the largest producers of Idaho Red Cedar Poles. Five well stocked, modern storage yards make prompt shipments possible. All treating specifications can be met.

It is the aim of Weyerhaeuser men to merit future orders by handling present ones to the entire satisfaction of the buyer.

The next time you are in the market give this service a tryout. Prices furnished promptly.

Weyerhaeuser Sales Company

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Weyerhaeuser Idaho Red Cedar Poles

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I think it is extremely unsound doctrine. But in my opinion, if it is to be successful in the long run, such stock owned by the public must be voting stock.

It is not a matter of rendering uncertain the control and management of the utility, but solely that the customer-owner feels more closely allied to the utility if annually he is invited to a stockholders' meeting or is asked to send a proxy. No par stock is usually voting stock, but I do not believe it is possible to sell no par stock widely in customer ownership. If that is true and if it may be conceded that the customer owner should have the privilege of voting, then a pronounced objection exists against no par stock for public utilities."

Mr. Browne's paper, a lengthy one, analyzed the arguments for and against no par stock, and while he favored permission to issue this under proper legal restrictions, he did not take much stock in the arguments favoring it.

He said that the strongest reason apparent is the facility for retaining control with a minimum of investment that it offers. The same thing could be done with par stock, but the plan is there so obvious that anyone would notice it. It is much nicer to say the voting power is in 30,000 shares of no par stock than to say it is in the hands of $30,000 shares of common.

Mr. Browne says that the argument that relates to the protection of the investor leads to the conclusion that the one led astray by the wording a par stock certificate will be scared out because it is impossible for him to investigate what is behind no par stock.

Increase Asked and Granted Will Cover Depreciation Only.

The Wisconsin Railroad Commission, on August 22, authorized the Oneida Farmers Telephone Co. to increase its rate from $2 to $2.50 per month net, as requested in the company's application filed June 4. The commission's findings in the case are:

"The Oneida Farmers Telephone Co. owns and operates a rural telephone system consisting of three full metallic lines, aggregating about 50 miles of poles and 150 miles of wire, serving 57 subscribers. Fifteen of these subscribers are connected to and switched by the Rhinelander exchange of the Rhinelander Telephone Co., the remaining subscribers being switched by the Tomahawk exchange of the Wisconsin Valley Electric Co.

On account of the sparsely populated nature of the territory served, applicant's investment in property and plant is in excess of $100 per subscriber, an investment considerably higher than the average for rural telephone systems. The impossibility of earning anything like a fair return on this investment is frankly admitted.

Heretofore the company's revenues have been sufficient to cover only bare operating expenses without making any provision for accrued depreciation. The increase in rates applied for would increase the company's revenues in the amount of about $325 per year. This amount in itself is sufficient to cover only depreciation requirements and is certainly necessary if adequate service is to be maintained. While a rural rate of $2.50 may seem high, it should be remembered that conditions in this case are exceptional and the location of most of the subscribers such that an excess radius charge would ordinarily apply."

Higher Rates Approved for Common Battery Service at Shawano.

The Wisconsin Railroad Commission, on August 26, approved with minor modifications the schedule of increased rates proposed by the Wisconsin Telephone Co. for its Shawano exchange upon the conversion of the exchange from magneto to common battery operation. The new schedule which follows is to become effective the first day of the month following the day on which the new service is inaugurated:

	Net monthly rates	
	Old.	New.
Business, one-party	$3.00	$4.00
Business, two-party	2.50	3.50
Residence, one-party	2.00	2.75
Residence, two-party	1.75	2.25
Residence, four-party	1.25	2.00

After analyzing the company's claims the commission concludes that in order to render common battery service in Shawano the company will be required to increase its investment by $28,000 and that its operating expenses will be increased by $420 per year. In the commission's opinion a plant investment of $67,454 would have been necessary to have furnished common battery service to the subscribers in service in 1924.

The company's operations in 1923 resulted in a balance for depreciation and return amounting to 6.4 per cent and in 1924, a balance of 7.5. Under the proposed rates it is estimated that there would be about 13.1 per cent for return and investment. Says the commission in conclusion:

"As the depreciation requirement is approximately 5 per cent of the plant value in exchanges of this type it is apparent that the company has not been earning an adequate return on its investment during the last two years and would earn only 8 per cent for return under the new rates. As a return of 8 per cent is not unreasonable we shall approve the rates proposed by the applicant with a few minor modifications."

Summary of Commission Rulings and Schedule of Hearings.

ARKANSAS.

August 19: The Southwestern Telephone Co., successor to the Rice Belt Telephone Co. of Stuttgart, granted authority to issue and sell $175,000 first mortgage bonds. Proceeds from the sale are to be used in purchasing the property of the Rice Belt company in Stuttgart, DeWitt, Gillett and Almyra, Arkansas county. S. A. Lane of Little Rock, state manager for the Southwestern Bell Telephone Co., is president of the new company.

CALIFORNIA.

August 27: The commission has granted the following extensions of time in which certain telephone companies shall comply with the statutes regulating overhead electric line construction subject to regulation by the commission: Sierra-Madre Telephone Co., January 1, 1926; Monrovia Telephone & Telegraph Co., January 1, 1926; Home Telephone Co. of Covina, July 1, 1926.

August 28: Volcano Telephone Co., operating a general telephone business in the town of Volcano, Amador county, and telephone toll lines in Amador and Calaveras counties, applied for permission to place in effect service connection charges.

INDIANA.

September 28: Opening of hearings in the matter of the investigation into the rate structure of the Indiana Bell Telephone Co. Hearing was originally set for September 1.

MICHIGAN.

August 20: Formal petition filed by Michigan Bell Telephone Co. for increased rates in practically all sections of the state. The commission immediately set September 8 for the hearing, when the company's plea will be considered along with the general readjustment of rates recommended by the commission's engineers. Application was previously made for permission to increase Detroit rates.

MISSOURI.

August 14: Application filed by the Southwestern Bell Telephone Co. for permission to purchase all the stock and property of the Home Telephone Co. of Joplin. The controlling stock in the Home company now is owned by the Kansas City Long Distance Telephone Co., which is under control of the Southwestern Bell.

A total of $1,800,000 is involved in the deal. The exchanges in Joplin, Webb City, Carterville, Carthage, Oronogo, Carl Junction, and Purcell, will be taken over by the Bell company if the deal is consummated.

NORTH CAROLINA.

August 18: Application filed by Randleman Telephone Co. to increase rates 50 cents per month per telephone.

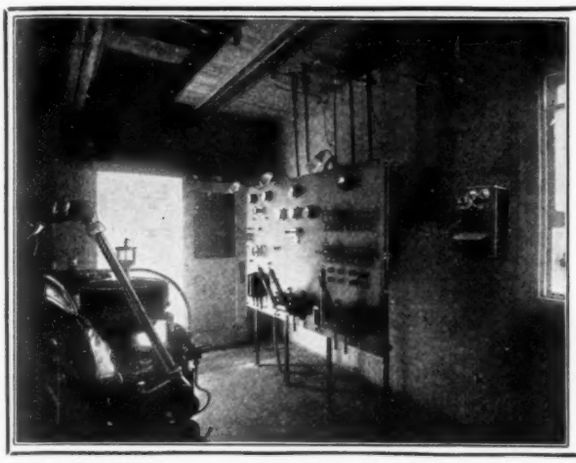
OHIO.

August 24: The protestants, having withdrawn their complaint upon which the commission suspended the proposed new rates of the Sycamore Telephone Co., which were published to become effective July 1, the schedule was restored to effect and the investigation discontinued.

August 25: The commission took up the suspended increased rates of the Wood County Telephone Co., filed to become effective June 1, 1924, in Bowling Green and Baltimore exchange areas and certified the following tentative valuations as of April 30, 1924, the day the schedules were filed. The company submitted valuations as of August 1, 1924.

Bowling Green.

Company values—	
Reproductive value	$276,428
Present value	226,476
Commission values—	
Physical property reproductive	$180,504
Present	138,210
Overhead and intangibles 7 per cent	9,681
Working capital 5 per cent	6,915
Rate base	$154,907



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Reproductive value	$ 95,415
Present value	74,159
Commission values—	
Physical, property reproductive	$ 67,162
Present	47,928
Overhead and intangibles 7 per cent	3,354
Working capital 5 per cent	2,396
Rate base	$120,840

August 29: Upon the protest of the mayor of Ada, the commission suspended the proposed new monthly rates of the Ada Telephone Exchange Co. which had been filed to become effective September 1 in the other villages:

Business, individual	$2.50 to $4.00
Residence, individual	1.50 to 2.50
Residence, four-party	new to 2.00
Rural, business	new to 4.00
Rural, residence	1.50 to 2.00

August 29: Upon the protest of the local exchange club, the commission suspended the following increased yearly rates, which the Local Telephone Co. had filed to become effective September 1 at New London:

Business, individual	$30 to $42
Business, four-party	24 to 36
Residence, individual	18 to 27
Residence, four-party	15 to 21
Rural, business	18 to 42
Rural, residence	18 to 24

OKLAHOMA.

August 27: Hearing held on complaint of H. C. Morris against the Southwestern Bell Telephone Co., alleging discrimination and failure to install telephone service. No 6859.

September 4: Hearing in case of Southwestern Bell Telephone Co. vs. the Schulter Telephone Co., alleging violation of the commission's order No. 912.

September 4: Hearing in the matter of the Southwestern Bell Telephone Co. vs. the Kiowa Telephone Co., alleging violation of the commission's order No. 912.

September 11: Hearing in the court room in Oklahoma City in re application filed by E. C. Patton, attorney of Oklahoma City, for an order authorizing telephone companies operating 1,250 stations or less to make an additional charge of 25 cents per month to its regular rates when a desk set is requested instead of a wall telephone.

PENNSYLVANIA.

September 10: Hearing on petition of the Union Telephone Co., of California, for permission to sell and transfer its plant to the Bell Telephone Co. of Pennsylvania. The Union company operates in California, Coal Center, Newell, Phillipsburg and Granville and has many rural lines.

SOUTH DAKOTA.

August 28: Hearing held at Wessington Springs in the matter of the investigation of alleged unreasonableness of the telephone rental rates charged and collected by the Dakota Central Telephone Co. for exchange and rural party lines service at Wessington Springs.

WEST VIRGINIA.

August 20: The Silver Hill Telephone Co., of Silver Hill, asked for permission to increase its rates from $8.00 to $16.00 a year. The company operates lines in Wetzel and Marshall counties.

WISCONSIN.

August 22: Oneida Farmers Telephone Co. authorized to increase its present rural rate from $2 net per month per telephone to $2.50 net per month per telephone, effective September 1. U. 3263.

August 26: Wisconsin Telephone Co. authorized to establish a schedule of increased rates at its Shawano, effective for service rendered on and after the first day of the month following the day on which common battery service is inaugurated. U. 3190.

September 9: Hearing at Madison on application of the Rosendale Telephone Co. to increase rates. U. 3290.

September 16: Hearing at Madison on application of the Marathon City Telephone Co. for authority to apply a 10-cent toll charge. U. 3294.

September 22: Hearing at Columbus on application of the Wisconsin Telephone Co. for authority to increase rates at Columbus. U. 3280.

September 23: Hearing at Stevens Point on application of Wisconsin Telephone Co. for authority to increase rates at Stevens Point. U. 3281.

September 24: Hearing at Hudson on application of the Wisconsin Telephone Co. to increase rates at Hudson. U. 3293.

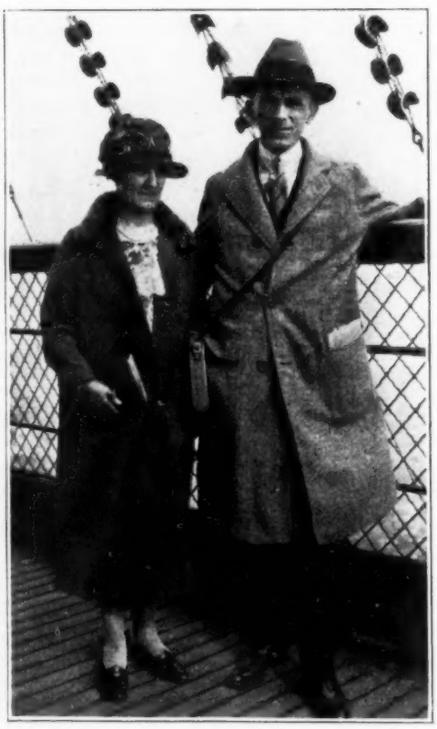
With the Manufacturers and Jobbers

European Radio Conditions as Seen by Prominent Engineer.

The universal use of plug-in type coils, the lack of multi-tube receivers and the great abundance of crystal receivers are the outstanding causes of the general backwardness of European radio noted by the American fan who visits England, France and Belgium, according to Ray H. Manson, chief engineer and a director of the Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., who has just returned from a tour of these countries for the purpose of studying radio conditions in Europe.

In commenting upon these differences, Mr. Manson said: "The real reason why the old style plug-in coils are still used abroad is because the radio industry there is not yet standardized to a point where but one universal wave band is used. Several of the most powerful stations are operating on waves ranging around 1,600 meters, while others use the 300 to 500 meter bands as in this country. Obviously, in order to cover both bands plug-in coils must be used.

"The lack of multi-tube sets in Europe is not because they are unpopular but because the tax on radio sets and the high cost of radio material make the possession of a fine radio receiver almost an impossibility. The great majority of sets seen



Mr. and Mrs. Ray H. Manson on the Eiffel Tower, Paris, Immediately Under the Transmitting Antenna of That Famous Station.

in the countries I visited were one and two-valve receivers. Once in a while a three-tube set was found. Almost all of the sets found in homes have been constructed by the owners."

In explanation for the thousands of crystal sets found in operation, Mr. Manson said: "The crystal receiver is in great favor in England, especially because of its economy and also because the great station at Daventry affords crystal set reception from as far away as 50 miles."

Another factor that tends to complicate the development of radio abroad is the great variety of tubes on the market there, he states. Visiting one of the radio dealers in England, he found that there were at least four main manufacturers of tubes, each of whom put out a special tube for use as radio amplifier, another for detector, and still a third for audio amplifier, making at least 12 different types from which the novice is obliged to choose.

In the city of Antwerp Mr. Manson found that the only real radio entertainment available was from stations operating in the vicinity of 1,600 meters. This is because of the great number of ships coming in and going out of the harbor, which causes great interference with the broadcast band of 300 to 500 meters.

Summing up, Mr. Manson said: "The countries I visited are, as a whole, far behind America in radio development, not so much in transmission as in recep-

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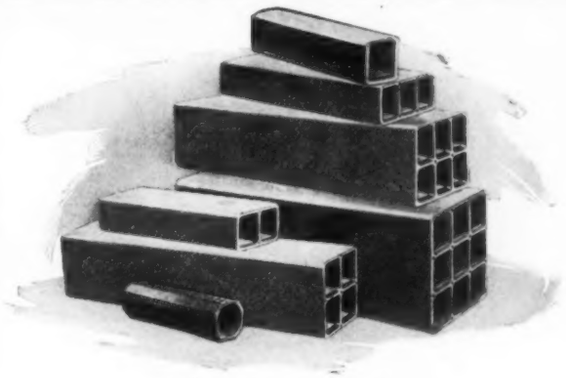

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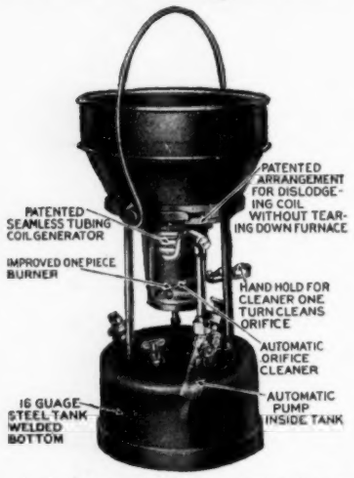
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tion, due of course to the prohibitive cost of building and maintaining a multi-tube receiver. This condition can be traced to the unsettled economic conditions at present existing in all European countries. However, as conditions there readjust themselves, as I feel they will before long, I look to Europe as a most fertile field for American-made radio products."

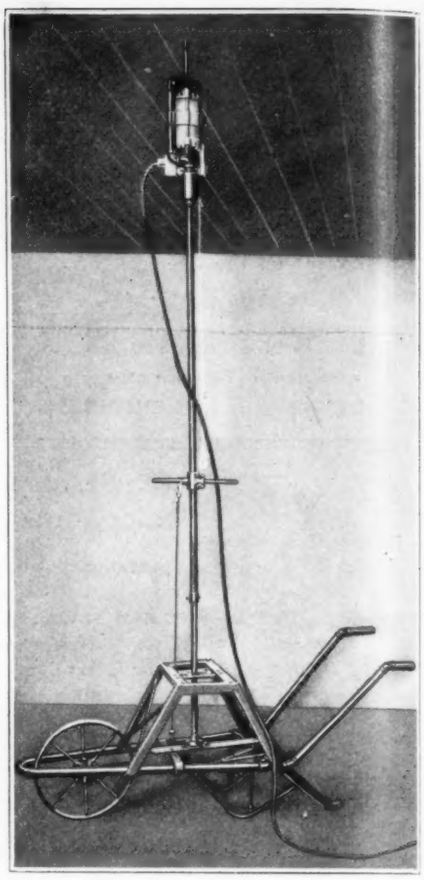
Overhead Drilling Stand for Syntron Electric Hammer.

The constantly increasing use of concrete in industrial construction has brought with it many new problems: How to drill up-holes economically is one of them. Hundreds of thousands of such holes must be drilled every year—to hang shafting, to strap electric conduit and telephone cable, to run sprinkler lines, to fasten partitions and steel sash, to anchor conveyors, etc.

The National Electric Mfg. Co., of Pittsburgh, Pa., has solved this problem, at least for the users of Syntron electric hammers. The device illustrated on this page is simple, rugged and effective.

Two telescoping pieces of steel tubing are used to provide height adjustment. The Syntron hammer is clamped firmly to one end while an additional clamp holds the drill chuck. Handles are placed at working height on this tubing so that the operator may easily steady the tool and

Using Syntron Electric Hammer With Drilling Stand.



Nemco Up Drilling Stand with Wheelbarrow Transporting Attachment.

rotate the drill. Power control is conveniently provided by running a draw wire from the trigger switch to the handle position.

A coil spring below the telescoping join on the tubing provides the means of maintaining the steady pressure needed to make the drill bite in.

The Nemco up-drilling stand is provided for use with or without a wheelbarrow transporting attachment, as illustrated.

With this attachment, however, much time and effort is saved to the operator. It so simplifies the work of moving to the next "spot" that, on test, a single workman drilled 125 up-holes on three floors without any assistance.

Telegraph and Telephone Conditions in East Africa.

The Eastern Telegraph & Cable Co. operates submarine cables out of Mombasa and Zanzibar, but all land telegraph and telephone lines in East Africa are government-owned and are operated by the post office department, reports Consul Avra M. Warren, Nairobi.

Telegraph lines follow the Uganda Railway, and connect Mombasa, Nairobi, Kisumu, Kampala, Entebbe, Moshi, Tanga, and Dar-es-Salaam. The plan to extend telegraphic communications to all the post offices of Kenya awaits the allocation of

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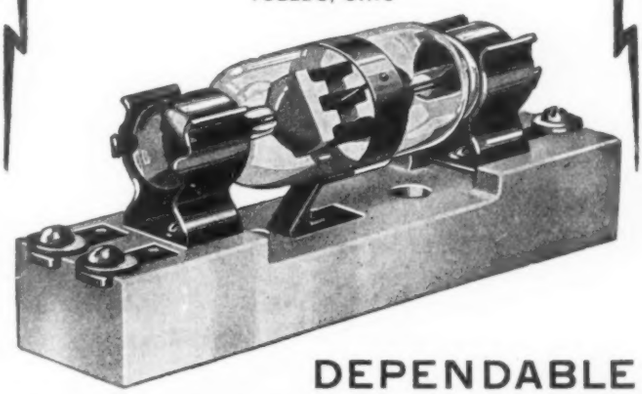

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government funds. Telephone lines, on the other hand, are to be found only in the larger towns, such as Mombasa and Nairobi. There is no long-distance system.

Telegraph and telephone instruments and apparatus are purchased by the government from British makers through the Crown agents for the colonies, London.

Ericsson & Co., of Beeston, Nottinghamshire, supply a magneto telephone instrument that is standard equipment for all installations in Kenya and Uganda.

During 1923 Great Britain furnished £4,475 worth of electrical equipment and Germany £23, while in 1924 receipts were from Great Britain £7,244 and from Belgium £25.

First Issue of "The Syntron" Off the Press.

Issue No. 1 of Volume 1 of "The Syntron" has recently been issued by the National Electric Manufacturing Co., of Pittsburgh, Pa. It is an attractive little 16-page magazine, 5½ by 8½ inches in size, and contains much information of interest to all who are concerned with reducing labor costs, with sufficient wit and humor interspersed to make it very palatable.

The Syntron, with which many of TELEPHONY's readers are familiar, is an electric hammer with "only one moving part" for drilling or chipping in concrete or masonry. It is claimed that one man with a Syntron hammer can do the work of 10. It may be used with big savings in time and cost wherever the rapid blows of a hammer are needed.

The initial issue of "The Syntron" tells how the Syntron electric principle was discovered and contains other interesting information. It will be sent monthly to anyone interested in reducing labor costs, upon request.

Company Pays Chicago $703,129 as Six Months' Share.

A check for $703,129, representing 3 per cent of its gross receipts for the six months ending on June 30 was handed to City Controller Martin J. O'Brien by the Illinois Bell Telephone Co. August 27. The payment is required by the telephone rate ordinance of 1907.

Prices in the Metal Markets.

New York, August 31—Copper—Dull; electrolytic, spot and futures, 14⅝@14¾. Tin—Easy; spot and nearby, $56.75; futures, $56.62. Iron—Steady; No. 1 northern, $19.50@20.00; No. 2 northern, $19.00@19.50; No. 2 southern, $18.50@19.00. Lead—Steady; spot, 9.50@10.00c. Zinc—Steady East St. Louis spot and futures, 7.60c. Antimony—Spot, 17.00c.

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